

By the Same Author

THE DIFFICULT CHILD AND THE
PROBLEM OF DISCIPLINE
INTELLIGENCE TESTS FOR YOUNG CHILDREN
THE NEW PSYCHOLOGY OF THE
UNCONSCIOUS
AN INTRODUCTION TO EXPERIMENTAL
PSYCHOLOGY

The Psychology of Early Childhood

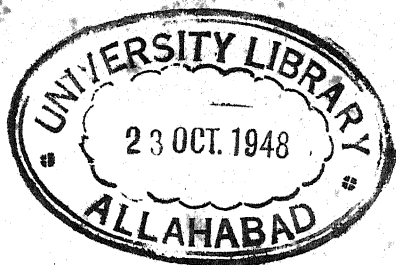
A STUDY OF MENTAL DEVELOPMENT IN
THE FIRST YEARS OF LIFE

by

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of Birmingham*



THIRD EDITION

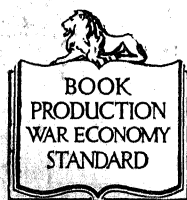


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TO
THE FIVE LITTLE PEOPLE
WHO SO GENEROUSLY SUPPLIED
MOST OF THE FACTS

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THIS BOOK IS PRODUCED
IN COMPLETE CONFORMITY WITH
THE AUTHORIZED ECONOMY STANDARDS

PREFACE

In this book an attempt is made to trace, from their very earliest appearances after birth, all aspects of mental development in childhood up to the age of about 4 or 5. It is based largely on the author's almost daily observations of his own five children, over a period of some twenty years, supplemented by numerous tests and experiments. In addition, observations have been made for me by a number of former students and other psychological friends on their own children in reference to special problems. All this evidence is discussed in relation to other published diary records made on the first three or four years of life by reliable observers (usually parents of the children)—from Preyer to Wilhelm Stern, and from Darwin to the Dionne Quins. There are now some dozen or more of such records of great value; but material from them has never been systematically collated into a single review of normal growth. They need co-ordinating and supplementing by precise reports on the very beginnings of mental functions and impulses.

In addition, the whole is constantly considered in relation to many published records of observations and experiments made on groups of children in reference to particular functions. Thus the book seeks to deal with the very *foundations of child psychology*. Indeed, this is a phrase that would have well expressed my main aims and I might have chosen it for the title (so avoiding the repetition of the title of Stern's well-known book), but in the present state of our knowledge it seemed too pretentious to claim to have covered the entire foundations.

The first purpose of the book is naturally to advance our knowledge of the psychology of childhood. The importance of such knowledge is now increasingly recognized. Even if all is not completely determined by the first four or five years of life, as some psycho-analysts would have us believe, there is little doubt that these first years are of profound significance for future development: and the better understanding and training of the little child may be at the root of many of our educational and social problems.

It is also hoped that the student of general psychology will find material of value, especially in the evidence given in nearly every

chapter as to what are genuine inborn tendencies in man. All the capacities and impulses of adulthood take on a new aspect when studied from their beginnings, for then they can be seen in their crudity. The student of psychology who has neglected the genetic approach often reveals serious gaps in his knowledge. The genetic approach not only gives us the best clue to innate propensities, but it helps us to understand more clearly many fundamental points of general psychology. To mention only a few treated in this book : the detailed study of reflexes in infancy compels us to define more exactly the distinction between reflex and instinct, the study of play in the first three years illuminates the general theory of play ; observations on imitations reveal the inadequacy of the Gestalt and other theories of imitation ; the appearance of early fears reveals innate tendencies in addition to those allowed by the Behaviourists ; the detailed reports on sex development and the attitude to parents in the first few years, undermine the Freudian foundations of human nature on sex attitudes in infancy. The chapter on the origin of laughter includes evidence revealing the inadequacy of well-known theories of laughter.

Further, as most chapters of this book can be read independently, specialists in various topics may find individual chapters of service in their own particular lines. Thus the linguist interested in the origins of language may turn to the chapter on Language ; the physiologist may find some interest in the chapter on Reflexes ; the medical man and others concerned with child psycho-therapy will find relevant material in the chapters on Fear, Aggression, Parents and the Oedipus Complex, and Sex Development. Indeed, most of the volume has a bearing on the question of what is normal and what abnormal in the development of children. Those concerned with the testing of infant development will find many facts showing that mental functions may appear considerably earlier in the environment of home than in the formal and more disconcerting surroundings of the Clinic or Laboratory, even allowing for higher intelligence quotients of most of their own children studied by psychologists.

It is hoped that the book will also be of service to some parents, who, having made some acquaintance with psychology, wish to study the development of their own children ; and also that it will be a stimulus and guide to much needed research on the very

beginnings of mental life; here the various new types of experimental tests should be of value, for it is often important that occasional observations should be supplemented by repeated tests or experiments, if chance coincidences are not to be misinterpreted.

Parts of a few chapters have already appeared in psychological journals, and my thanks are due to the Editors of the following for permission to make use of the material published by them: *The British Journal of Psychology* (article on The Psychology of Imitation, 1930), *The Journal of Genetic Psychology* (article on The Innate Basis of Fear, 1930), *Le Journal de Psychologie* (article on La Psychologie Génétique du Rire, 1936), *The British Journal of Medical Psychology* (article on Reflexes in Infancy, 1927). In all cases, however, these earlier papers have been carefully revised and in most cases very considerably extended. My thanks are also due to the Trustees of the Leverhulme Fund for Research Fellowships, for a grant which set me free from University duties for some months during 1935 and enabled me to put together a considerable part of this book.

My indebtedness to former workers in the field of child psychology will be clear from many references in this book. My debt to the group of friends and former pupils who have made careful records of the development of their own children is also acknowledged by references throughout the book. I should also like to express thanks to my wife for help in recording observations on our own children and with the proofs.

I am very grateful for helpful comments on the chapter on Reflexes by Dr. C. S. Myers and Dr. H. P. Gilding (Professor of Physiology in the University of Birmingham), and to my colleague Mrs. F. M. Austin for dealing similarly with the chapter on Suggestion. To my secretary, Miss J. M. R. Christie, my thanks are due for help with the typescript and proofs at all stages. My greatest debt is to Professor Cyril Burt, who generously read the whole book in typescript: his wide range of knowledge and his penetrating analysis resulted in many extremely valuable comments and suggestions which have improved every chapter.

C. W. VALENTINE

February 1942

I regret that war-damage and the inaccessibility of some libraries has prevented the checking of a few of the references.

PREFACE TO THE THIRD EDITION

The book has been re-set and a few slight emendations made. I have added a number of useful observations made by Mr. W. D. Wall on his two children, and my thanks are due to him for help with the proof-reading for this edition, and to my wife and eldest son, Lieut.-Col. W. H. Valentine, O.B.E., for further help with the proofs.

C. W. V.

July 1945

CONTENTS

CHAPTER

PAGE

PREFACE

V

I. INTRODUCTORY

I

VALUE OF THE STUDY OF EARLY CHILDHOOD : FOR 'PURE' SCIENCE OF PSYCHOLOGY, EVIDENCE OF WHAT IS INNATE, ELEMENTARY FUNCTIONS MAY BE OBSERVED IN GREATER ISOLATION. PRACTICAL VALUES OF THE STUDY OF EARLY INFANCY : EARLY DIAGNOSIS OF MENTAL DEFICIENCY ; EARLY DIAGNOSIS AND TREATMENT OF 'PROBLEM' OR 'NERVOUS' CHILDREN. RECENT DEVELOPMENTS WHICH HAVE EMPHASIZED THE NEED AND IMPORTANCE OF THE STUDY OF EARLY CHILDHOOD. THE PSYCHO-ANALYTIC VIEW THAT CHARACTER IS DETERMINED BY THE AGE OF 4 OR 5. THE ATTEMPTS TO TEST INTELLIGENCE AT 6 OR 12 MONTHS. THE APPEARANCE OF SPECIAL ABILITIES. EARLY APPEARANCE OF SPECIAL LINGUISTIC ABILITY. THE CHILD GUIDANCE MOVEMENT, AND EARLY DIAGNOSIS OF TEMPERAMENTAL ABNORMALITIES. THE NURSERY SCHOOL AND THE TRAINING OF THE PRE-SCHOOL CHILD. INNATE DIFFERENCES AND ABNORMALITIES AND THEIR RELATION TO CHARACTER AND BEHAVIOUR

II. METHODS OF THE STUDY OF INFANT PSYCHOLOGY

26

THE METHOD ADOPTED. INDIVIDUAL DIFFERENCES IN THE CHILDREN STUDIED. THE NEED FOR BIOGRAPHICAL STUDIES. PARENTS AS OBSERVERS OF THEIR OWN CHILDREN. ARE THE CHILDREN OF PSYCHOLOGISTS A SELECTED TYPE ? OBSERVATIONS—PREPARED *versus* UNPREPARED. EXPERIMENTS AND OBSERVATION. THE 'BEHAVIOURIST' METHOD AND INTERPRETATION

III. FUNDAMENTAL FACTORS IN MENTAL DEVELOPMENT : MATURATION, EXERCISE AND PHYSIOLOGICAL CON- DITIONS

42

THE MEANING OF 'DEVELOPMENT'. MATURATION. EXPERIMENTS TO TEST MATURATION. MATURATION AND EXERCISE. PHYSIOLOGICAL CONDITIONS AND MENTAL DEVELOPMENT. FUNDAMENTAL AND HIGHER FUNCTIONS. MATURATION AND PHYSIOLOGICAL CONDITIONS

IV. FURTHER ASPECTS OF MENTAL DEVELOPMENT

54

THE INTERMITTENT NATURE OF DEVELOPMENT. ANTICIPATORY DEVELOPMENTS. PRECOCITY AND RETARDATION. ALTERNATIONS OF SPECIFIC DEVELOPMENTS

V. ENDOWMENT AND BEHAVIOUR OF THE NEW-BORN INFANT

61

THE NEONATE. A DIARY OF THE FIRST FORTNIGHT. ADVANCES IN THE SECOND FORTNIGHT. SENSITIVITY TO PAIN. THE EARLY ACTIVITY OF SIGHT. THE FIRST ASSOCIATION THROUGH TOUCH OR BODILY POSITION. ASSOCIATION WITH SIGHT. ASSOCIATION WITH SOUNDS

VI. SPONTANEOUS MOVEMENTS AND THE BEGINNING OF THE CONTROL OF MOVEMENTS

74

CONSTANT SPONTANEOUS MOVEMENTS IN THE FIRST MONTHS. THE APPARENT AIMLESSNESS OF SPONTANEOUS MOVEMENTS. STIMULATION OF SPONTANEOUS MOVEMENTS BY EXCITEMENT AND INHIBITION BY ATTENTION. CO-OPERATION WITH REFLEXES. DEVELOPMENT INTO DEFENCE MOVEMENTS. DEVELOPMENT INTO HABITS. THE BEGINNING OF CONTROL OF MOVEMENTS. THE SIGNS OF VOLUNTARY MOVEMENTS (*a*) SLOW SPEED AND (*b*) LOOKING AT THE MOVING HAND. CONFLICT OF VOLITIONAL WITH SPONTANEOUS MOVEMENTS. CO-OPERATION OF SIGHT AND TOUCH WITH SPONTANEOUS MOVEMENTS. ORDER OF TRANSITION FROM SPONTANEOUS TO CONTROLLED MOVEMENTS

VII. THE EARLIEST EXPRESSIONS AND CAUSES OF FEELINGS OR EMOTIONS

84

THE NATURE OF THE FIRST FEELINGS AND EXPRESSIONS. IS DISPLEASURE PREDOMINANT AT FIRST? EARLY CAUSES OF CRYING. THE GRADUAL DIFFERENTIATION OF EXPRESSIONS OF DISPLEASURE. INDIVIDUAL DIFFERENCES. EXPRESSIONS OF PLEASURE OR SATISFACTION. DELIGHT IN HUMAN COMPANIONSHIP. VARIETY OF EXPRESSIONS AND CAUSES OF SATISFACTION OR PLEASURE. DELIGHT IN COLOUR. CHANGEABILITY OF FEELINGS. LATER INDIVIDUAL DIFFERENCES IN THE EXPRESSION OF FEELINGS. EXPRESSION AND CAUSES OF FEELINGS AFTER AGE OF 6 MONTHS. INCREASING DIFFERENTIATION

VIII. REFLEXES: THEIR DEVELOPMENT, VARIABILITY AND EVANESCENCE AND THEIR RELATION TO VOLUNTARY MOVEMENTS AND INSTINCTS

100

THE FINGER-GRASP REFLEX. THE FINGER-GRASP IN SLEEP. THE FINGER-GRASP IN RIGHT AND LEFT HANDS. THE TRANSITION FROM REFLEX TO PURPOSEFUL OR VOLUNTARY GRASPING. SIGHT AND TOUCH CO-ORDINATION. REFLEXES AND VOLUNTARY MOVEMENT. EYE-MOVEMENTS—REFLEX OR CONTROLLED. THE EVANESCENCE OF A REFLEX, (*a*) THE ARM-RAISING REFLEX AND (*b*) THE WALKING REFLEX. THE INHIBITION OF REFLEXES. THE INHIBITION OF CRYING. DEVELOPMENT OF THE EYE-BLINK REFLEX. THE EYE-BLINK IN RESPONSE TO SOUNDS. THE INSTABILITY OF A REFLEX. VARIABILITY OF A REFLEX UNDER VARYING GENERAL CONDITIONS. REFLEX OR INSTINCT: THE SUCKING IMPULSE. THE DISTINCTION BETWEEN REFLEXES AND INSTINCTS. SUPPOSED MARKS OF A REFLEX, AS CONTRASTED WITH AN INSTINCT. THE CONCEPT OF REFLEX INADEQUATE FOR INSTINCTIVE AND PURPOSEFUL ACTIONS. SUMMARY OF GENERAL OBSERVATIONS ON REFLEXES IN INFANCY

IX. THE BEGINNINGS AND SIGNIFICANCE OF PLAY

140

THE DEFINITION OF PLAY APPLIED TO INFANT ACTIVITIES. THE FIRST FORMS OF PLAY. FIRST SOCIAL PLAY. PLAY BETWEEN 6 MONTHS AND 12 MONTHS. PLAY BETWEEN 12 AND 18 MONTHS. SOCIAL PLAY. IMITATION IN PLAY. REPETITION IN PLAY. MAKE-

Contents

xi

CHAPTER

PAGE

BELIEVE PLAY FROM 1½ TO 2½ YEARS. MAIN PLAY ACTIVITIES, 1; 6 TO 3; 0. PLAY WITH NOVEL SENSATIONS OR EMOTIONS AND IMPULSES. DIFFICULTIES AND DANGERS IN THE INTERPRETATION OF PLAY. SYMBOLIC AND FANTASY INTERPRETATIONS OF PLAY. PLAY-THERAPY

X. THE PSYCHOLOGY OF IMITATION

172

WIDE DISAGREEMENT AS TO THE PSYCHOLOGY OF IMITATION. EARLIEST APPEARANCE OF IMITATION: SOUND MAKING AT ONE MONTH. SMILE AND LAUGHTER RESPONSES. EARLY IMITATION OF MOVEMENTS. IMITATION OF DEFINITE SOUNDS. IMITATION OF MOVEMENTS: 6 TO 12 MONTHS. THE LATENT PERIOD AND THE EFFECT OF REPETITION. SUMMARY OF EVIDENCE UP TO 12 MONTHS AND SUGGESTIONS OF A THEORY OF IMITATION. EXPERIMENTS ON IMITATION AT 12 MONTHS. EXPERIMENTS ON IMITATION AT ABOUT 2; 0. THE IMPORTANCE OF THE IMITATEE. RATIONAL OR PURPOSEIVE IMITATION. PRIMARY IMITATION AMONG ADULTS. EXPERIMENT ON PURPOSEIVE IMITATION OF MEANS TO A DESIRED END. PRIMARY IMITATION AMONG ADULTS

XI. THE INNATE BASES OF FEARS

203

THE NEED FOR STUDY IN EARLIEST INFANCY. THE INFLUENCE OF EXPERIENCE. THE INFLUENCE OF MATURITY. THE INHIBITING OF INNATE FEARS BY FAMILIARITY. THE EARLIEST SIGNS OF NERVOUS SHOCK OR FEAR WITH SPECIAL REFERENCE TO SOUNDS. FEAR OF THE DARK IN THE FIRST YEAR. THE INFLUENCE OF GENERAL CONDITIONS ON FEAR. FEAR OF PAIN. FEAR OF HIGH PLACES. THE APPEARANCE OF OTHER FEARS, WITH SPECIAL REFERENCE TO ANIMALS. EXPERIMENTS ON 'CONDITIONED' FEAR RESPONSES. FEAR OF THE UNCANNY. FEAR OF THE SEA. FEAR OF THE DARK. INDIVIDUAL DIFFERENCES. PLAYING AT FEAR. THE GRADUAL DIFFERENTIATION OF EXPRESSIONS OF FEAR

XII. GENETIC PSYCHOLOGY OF LAUGHTER

231

SOME FAMOUS THEORIES OF LAUGHTER. THE BEGINNINGS OF LAUGHTER IN INFANCY. LAUGHTER AS EXPRESSION OF DELIGHT. LAUGHTER RESPONSIVE TO LAUGHTER. SMILING DURING THE PERIOD 0; 2 TO 0; 4. LAUGHTER AT PLEASING OBJECTS, TICKLING, MILD SHOCK, REPETITION, THE INCONGRUOUS. LAUGHTER AND PLAY. LAUGHTER AT IMITATION, RECOGNITION, NEW FORMS OF ACTIVITY, TEASING, DISCOMFITURE OF OTHERS, INCONGRUITY IN WORDS, COINCIDENCES. THE CONTINUANCE OF THESE FORMS OF LAUGHTER IN LATER LIFE. THE SIGNIFICANCE OF THE ORDER OF DEVELOPMENT. SUGGESTIONS TOWARDS A THEORY OF LAUGHTER

XIII. SUGGESTION AND SUGGESTIBILITY

253

THE MEANING OF SUGGESTION. THE INFLUENCE OF SUGGESTION ON SLEEP. THE 'CURE' OF PAIN BY SUGGESTION. SUGGESTION OF THE UNPLEASANT OR THE FEARSOME. SUGGESTION AND FOOD. LIMITS OF SUGGESTIBILITY. SUGGESTION AND AESTHETIC JUDGEMENT. AUTO-SUGGESTION. CONTRA-SUGGESTIBILITY. AN EXPERIMENTAL TEST OF SUGGESTIBILITY OR IMITATION. RATIONAL GROUNDS OF THE CHILD'S BELIEF IN ADULTS

XIV. ANGER AND PUGNACITY

265

ANGER, PUGNACITY, PERSISTENCE, SELF-ASSERTION AND SELF-DISPLAY. THE FUNDAMENTAL NATURE OF PERSISTENCE. THE EARLIEST SIGNS OF ANGER. DIFFICULTY IN DISCRIMINATING BETWEEN ANGER AND DISTRESS. MORE DECIDED SIGNS AT ABOUT THE AGE OF ONE YEAR. THE FIRST APPEARANCE OF PUGNACITY. ANGER AND PUGNACITY. PLAYING AT ANGER AND PUGNACITY. VARIATIONS OF ANGER WITH AGE. SEX DIFFERENCES IN ANGER AND PUGNACITY

XV. SELF-ASSERTION, SUBMISSION, DISPLAY AND SHYNESS

279

EARLY SIGNS OF ASSERTIVENESS AND PERSISTENCE. ASSERTIVENESS AND OPPOSITION TO OTHERS. PLAYING AT SELF-ASSERTION BY CHILDREN FROM 2 TO 5. SELF-DISPLAY DISTINGUISHABLE FROM SELF-ASSERTION. ASSERTIVENESS WEAK IN SOME CHILDREN. SUBMISSION. SHYNESS. DISTINGUISHING STRANGERS FROM PARENTS. DISTINCTION BETWEEN SHYNESS AND FEAR. SHYNESS AS A SEPARATE INNATE TENDENCY

XVI. SYMPATHY AND AFFECTION

293

PRIMITIVE PASSIVE SYMPATHY. IS PRIMITIVE PASSIVE SYMPATHY INNATE? ACTIVE SYMPATHY, OR THE PROTECTIVE IMPULSE. THE INNATE BASIS OF ACTIVE SYMPATHY. SOLICITUDE AND HELPING. AFFECTION AND LOVE. ATTITUDE TO INFANTS OF SIMILAR AGE. ATTITUDE TOWARDS YOUNGER INFANTS. FREUD'S VIEWS AS TO THE RELATIONS BETWEEN INFANTS OF THE SAME FAMILY. AFFECTION FOR ANIMALS AND DOLLS

XVII. AFFECTION FOR PARENTS AND THE SUPPOSED OEDIPUS COMPLEX

309

FIRST SIGNS OF SOCIAL RESPONSE. DATE OF RECOGNITION OF PARENTS. DIFFERENCES IN ATTITUDE TOWARDS FATHER AND MOTHER. THE SUPPOSED OEDIPUS COMPLEX IN CHILDREN. THE PARENTS' ATTITUDE TO THE CHILD OF THE SAME AND THE CHILD OF THE OPPOSITE SEX. A QUESTIONNAIRE ON THE ATTITUDE TOWARDS PARENTS AND THE DEVELOPMENT OF SEX IN INFANCY. THE QUESTIONNAIRE. TABLE I. TABLE II. SUMMARY OF RESULTS. REASONS GIVEN FOR CHANGES IN PREFERENCES FOR A PARENT. DISCIPLINE AND ITS RELATION TO PREFERENCES. JEALOUSY SHOWN BY CHILDREN

XVIII. THE DEVELOPMENT OF SEX AND SEX-INTERESTS IN INFANCY

331

THE DISTINCTION BETWEEN (a) INTEREST IN SEX AND (b) TRUE SEX IMPULSES. THE SUPPOSED SIGNS OF SEX DEVELOPMENT IN INFANCY. THE SIGNIFICANCE OF KISSING AND THUMB-SUCKING. ERECTIONS AND MASTURBATION. THE CASTRATION COMPLEX. SEX IN FEMALE INFANTS. FURTHER TYPES OF EVIDENCE OF SEX EXAMINED. ANSWERS TO QUESTIONNAIRE ON SEX IN INFANCY. SUMMARY AND DISCUSSION OF ANSWERS

XIX. LEARNING AND REMEMBERING

353

ASSOCIATION, RECOGNITION, AND RECALL IN THE FIRST YEAR. THE POSSIBILITIES OF EARLY 'VISUAL MEMORY IMAGES'. THE NUMBER OF IMPRESSIONS NEEDED FOR AN ASSOCIATION TO BE ESTABLISHED. ASSOCIATION WITH COLOUR. ASSOCIATION AND RECALL IN THE

Contents

xiii

CHAPTER

PAGE

SECOND YEAR. IMPRESSIONS RETAINED BUT NOT RECALLED. MEMORY IN THE THIRD YEAR. EXPERIMENTS ON THE REMEMBERING OF DIRECTION AND POSITION. SUMMARY OF CONCLUSIONS AS TO REMEMBERING. EARLY MEMORIES REVEALED IN DREAMS

XX. THE BEGINNINGS AND DEVELOPMENTS OF LANGUAGE

367

ESSENTIAL ELEMENTS IN THE LEARNING OF LANGUAGE. EARLY SOCIAL INFLUENCES. EARLY INDIVIDUAL DIFFERENCES. DEVELOPMENT OF VARIETY OF SOUNDS. THE PRACTISING OF SPEECH. THE IMITATION OF SOUNDS. THE DEVELOPMENT OF CHILDREN BORN DEAF. GESTURE LANGUAGE. THE DAWN OF MEANING. THE UNDERSTANDING OF SPOKEN LANGUAGE IN THE FIRST YEAR. THE AFFECTIVE AND CONATIVE ASPECTS OF EARLY SPEECH. THE HISTORY OF THE USE OF 'TA'. THE SIGNIFICANCE OF FIRST WORDS. LANGUAGE IN THE SECOND YEAR. ONOMATOPOEIC WORDS. GESTURE LANGUAGE. SPEECH IMITATION IN THE SECOND YEAR. CONSTANT 'PLAYING' WITH OR 'PRACTISING' NEW SOUNDS. GREAT EXTENSION OF PASSIVE VOCABULARY. THE APPARENT GENERALIZATION OF WORDS. OTHER EXAMPLES OF GENERALIZATIONS. ADVANCES FROM 1;6 TO 2;0. USING TWO WORDS TOGETHER. OTHER NOTABLE ADVANCES BETWEEN 1;6 AND 2;0. FIRST USES OF THE NEGATIVE. DO CHILDREN INVENT WORDS? WORDS USED BY B AT 1;8. IMITATION TEST. THE REALIZATION THAT THINGS HAVE NAMES. SPEECH IN THE THIRD YEAR. THE PERIOD 2;0 TO 2;6. DIFFICULTIES OF GRAMMATICAL CLASSIFICATION. CONSTRUCTIVE WORK BY THE CHILD. THE OMISSION OF WORDS IMPLIED AND THE FIRST USE OF PREPOSITIONS. EXPERIMENTS ON THE USE OF PREPOSITIONS. TEST I.—UNDERSTANDING PREPOSITIONS. TEST II.—SPEAKING PREPOSITIONS. LEARNING NEW WORDS IN SPECIFIC CONTEXTS. FURTHER ADVANCES IN THE PERIOD 2;0 TO 2;6. THE LEARNING OF WORDS FIRST VAGUELY AS CONNECTED WITH A GROUP OF IDEAS OR IMPRESSIONS. THE PERIOD 2;6 TO 3;0. Y FROM 2;6 TO 3;0. COMPLEX SENTENCES. SPEECH AFTER 3;0. PLAYING WITH NEW WORDS. THE MONOLOGUE AND PIAGET'S VIEWS ON IT. SOME FURTHER NOTES AFTER 3;0 AND 4;0. THE VOCABULARY OF A BOY SOMEWHAT PRECOCIOUS IN SPEECH. TYPES OF WORDS USED BY THE BOY C. B.

XXI. IDEATIONAL OR THOUGHT PROCESSES

421

MEANING AND IMAGERY. COMPARISONS. THE FORMING OF CONCEPTS. FIRST GENERALIZING OF TERMS. IDEAS OF ACTIONS. THE APPREHENSION OF RELATIONS. THE APPREHENSION OF RELATIONS EXPRESSED IN LANGUAGE. THINKING WITHOUT WORDS. FURTHER RELATIONS APPREHENDED BY THE AGE OF 2;0. ATTRIBUTION OR CHARACTERIZATION. LIKENESS AND IDENTITY. THE RELATION OF DIFFERENCE. FURTHER RELATIONS EXPRESSED DURING THE PERIOD 2;0 TO 2;6. FIRST GENERALIZATIONS OR SUMMATIONS. HUMAN MOTIVES AND THE CAUSAL RELATION. THE UNDERSTANDING AND USE OF 'WHY'. THE APPREHENSION OF CAUSATION OF PHYSICAL EVENTS. PART-WHOLE RELATION. THE RELATION OF EVIDENCE. EARLY INFERENCES OR REASONING. FURTHER GENERALIZATIONS FROM 3;0 ONWARDS AND THEIR USE IN REASONING. OTHER TYPES OF REASONING AT 3;6 AND 4;0. RECIPROCAL (OR SYMMETRICAL) RELATIONS COMMUNICATING IDEAS. ASSUMING A FALSE HYPOTHESIS. DEFINITIONS. ANIMISM AND ANTHROPOMORPHISM IN THE IDEA OF PHYSICAL CAUSATION. THE CHILD'S IDEAS ABOUT THINKING. NOMINAL REALISM. THE CHILD'S INTEREST IN ITS OWN THOUGHT AND EXPERIENCES. THE USE OF 'BUT' AND 'ALTHOUGH'. THE NAIVETÉ OF THE CHILD

XXII. SOME SPECIAL ABILITIES AND IDEAS

466

THE APPREHENSION OF IDEAS OR RELATIONS OF TIME. THE APPREHENSION OF IDEAS OF NUMBER. Y'S DEVELOPMENT IN THE UNDERSTANDING OF NUMBER. B'S DEVELOPMENT AFTER 3;6. Y'S DEVELOPMENT AFTER 4;0. SUMMARY OF STEPS IN THE LEARNING OF NUMBERS

*THE APPREHENSION OF SHAPE. TESTS OF PERCEPTION OF SHAPE BY TOUCH. Y'S LEARNING OF GEOMETRICAL SHAPES. EXPERIMENTS ON LEARNING THROUGH TOUCH *versus* LEARNING THROUGH SIGHT. PRELIMINARY EXPERIMENT I, EXPERIMENT II: EXPERIMENT ON Y COLOUR DISCRIMINATION AND COLOUR PREFERENCES. SOME EXPERIMENTS WITH COLOURS. THE NAMING OF COLOURS. THE UNDERSTANDING OF PICTURES. THE REALISTIC ATTITUDE TOWARDS PICTURES*

APPENDIX I. STAGES OF DEVELOPMENT	495
APPENDIX II. RIGHT- AND LEFT-HANDEDNESS	505
APPENDIX III. THE EARLIEST DREAMS OF B	510
INDEX	514

THE PSYCHOLOGY OF EARLY CHILDHOOD

CHAPTER I

Introductory

Value of the study of early childhood. The study of the early years of childhood is of value for several reasons. For the man of genuine psychological curiosity, the fascinating interest of a developing mind is motive enough for studying it, while the importance of child psychology as a foundation for a science of education is obvious. Further, just as the study of childhood checks the tendency to over-rationalize our interpretation of adult behaviour, so the study of infancy lessens the danger of interpreting later childhood too much on the lines of adult experience. The significance of infant psychology for education, and for dealing with both normal and problem children will be dealt with more fully later.

Value for 'pure' science of psychology. The value of the study of earliest infancy for the 'pure' science of psychology will, I hope, often appear in this book.

Thus our discussion of reflexes will bring us to close grips with the controversy on the distinction between reflexes and instincts. The chapter on Fear gives evidence on the innate bases of fears, which the Behaviourists interpret as conditioned responses due to experience. Our study of imitation bears directly on, and I think refutes, the assertion of Gestalt psychologists that imitation (or what is almost universally recognized as such) always involves 'insight' and purpose. The chapter on Laughter supplies evidence that some well-known theories of laughter are quite inadequate. The chapters on Sex and the Oedipus Complex show the doubtfulness of the grounds on which some psycho-analytic interpretations of adult conduct are based.

Still more important, perhaps, is the fact that the most reliable evidence as to *what is genuinely innate in human nature* must be found in the study of human infancy. Even McDougall's massive contributions to the study of human instincts do not, I think, supply altogether satisfactory criteria as to what are the innate impulses,¹ valuable as they are as main guides. For the fact that a similar impulse is displayed in (apparently) instinctive activities of higher animals does not prove that in man that impulse is instinctive or innate. Indeed, McDougall himself only claimed that it

¹ *Social Psychology*, 9th edition, p. 49.

affords a strong presumption. Nor does the possibility of morbid exaggeration of an impulse give us a satisfactory clue, for many actions exaggerated to an abnormal degree owe at least their specific nature to experience.

The spontaneous occurrence of a new type of activity in the child, with first-hand evidence that it was not learned through experience, affords, it seems to me, the only certain proof of the genuine innateness of an impulse unless some activity developing later can also satisfy that criterion. Thus the foundations of child psychology are also some of the main foundations of human psychology as a whole.

The question of innate propensities has become more prominent in view of the bold challenges of the Behaviourist school, of Adler and of some psycho-analysts. Consider especially Dr. J. B. Watson's general view that there are few genuine innate tendencies in man, and the suggestion that any infant, if taken in hand early enough, can be 'conditioned' into almost any type of character. This assertion as to the absence of innate tendencies of an instinctive type can, as I hope to show later, be combated by evidence from early childhood, more particularly that gathered by continuous observation of the same child from birth over a period of years.

Most of those psychologists who, unlike Watson, believe that man possesses many innate tendencies, are still uncertain as to what precisely they are. For example, E. L. Thorndike emphasized our ignorance as to what situations originally provoke smiling, laughing, crying, frowning, imitation, fear, &c., and concludes that we can only solve the problem by direct observation of infants from birth.¹

The sociologist, as well as the educator, seeks from psychology more definite pronouncements as to inborn impulses and finds this lack of knowledge a hindrance. For example, Professor M. Ginsberg writes: 'Whether there is an original craving to hurt or destroy remains a question which urgently requires further investigation.'²

Closely associated with the problem of what is really innate, is the question of what innate mental differences there are between the sexes. This cannot be settled without a careful study of infancy before the influence of suggestion and tradition can have any effect; though the *absence* of differences during the first few years would not prove that innate differences do not exist: for they may exist between innate tendencies or capacities which only mature later, say at adolescence. We shall, however, find evidence that some sex differences reveal themselves soon after 12 months and probably before.

The solution of problems as to the hereditary transmission of

¹ See his *Educational Psychology*, Vol. I (New York, 1920).

² *Sociology*, p. III (London, 1934).

mental traits is also clearly dependent on our knowledge as to what is really innate.

Another value of the study of infancy lies in the fact that the *elementary functions may be observed in greater isolation* than they can be later. The instinctive impulses are now seen in their crudest form, less obscured than they are later by accretions from experience. Elementary cognitive processes, too, appear in their simpler forms and may be studied in their origins. The significance of time for maturing is only brought home to one by following and testing the development of the same child just at the stage when intellectual capacities are first appearing. Thus some 8 or 9 months elapsed (from about 2 years of age to about $2\frac{3}{4}$ years) from the time when one of my infants correctly used the number 'two' to the time when he could apprehend 'three' as a group; in another of my children the interval was even longer—so far is the truth from the supposed idea of a sudden development of a 'faculty of number'.

Practical values of the study of early infancy. There are further ways in which a more exact knowledge of development in infancy seems likely to prove of great practical value. They may be mentioned here briefly before the fuller discussion which will follow.

(a) The *early diagnosis of mental deficiency* may in a few cases at least, enable suitable treatment to be given. For example, cretinism, due to defective functioning of the thyroid gland, if discovered in the first year or two, may be treated successfully.¹ Physical signs sometimes betray cretinism as early as 3 or 4 months: appropriate psychological observations may help diagnosis even earlier. They may also lead to detection of other types of mental deficiency early enough to permit treatment. In types of mental deficiency where treatment is not possible, we might by early diagnosis at least prevent fruitless expectations and serious errors in the bringing up of the child. It might also prevent the adoption of such children by parents who will subsequently rue their choice. The fact that some mental defectives are socially responsive and physically attractive makes this danger the greater.² Professor Hollingworth, indeed, reports that one mental defective of 9 years of age was so attractive that he was adopted successively by four

¹ See Leo Kanner, *Child Psychiatry*, p. 192 (London, 1935). Dr. Arnold Gesell describes a remarkable case of an infant who at 6 months was only at the level of maturity of a normal one-month-old baby. Thyroid treatment had an immediate effect and by the age of 1; 6 she had reached the normal level for about 1; 2 (*Biographies of Child Development*, p. 86). Here and throughout this book I adopt the usual method of giving years and months separated by a semi-colon.

² See A. Gesell, *The Guidance of Mental Growth in Infant and Child*, Chap. 13, (New York, 1930).

different families, each time being returned to the charity organization with the report that he could learn nothing. Tests revealed that his I.Q. was about 65.¹

A very early and very certain diagnosis of serious deficiency will be needed for any decisive general policy of a revolutionary type in reference to defectives, such as is now being discussed. Drs. Berry and Gordon, for example, report without approval or disapproval a proposal that the lowest grade mental defectives should be given an overdose of morphia; that is for the perfectly hopeless, speechless, degraded imbeciles.² I have put the question to three young mothers, and they all said that if they knew that it was absolutely certain that a child of theirs would be a hopeless imbecile, they would think it kinder and better to have it 'put to sleep'.

(b) *Early diagnosis and treatment of 'problem' or 'nervous' children.* A fuller knowledge of the first two or three years would probably prove of great value in the training of those who, at a later stage, become the 'difficult' children in the home or school, or the 'problem' children of the Child Guidance Clinics. The general trend of medicine and of the treatment of crime is towards prevention: and there is, it seems to me, little doubt that we shall eventually do more and more in the pre-school period to prevent children becoming problem children. But for this we need a much more exact knowledge of what is abnormal in respect to many individual impulses and emotions, and what are only individual variations within normal and healthy limits.

Recent developments which have emphasized the need and importance of the study of early childhood. Three recent developments have especially emphasized the need of the study of the earliest years of life, and have greatly stimulated that study: first, the assertion by various psycho-analytic writers, including not only Freud but Adler and others, that the first few years of life are decisive for the character of the individual; second, the devising of intelligence tests for infants of 1 and 2 years of age, and even for 3 and 6 months; third, the Child Guidance Movement with its attempts to cure temperamental and character abnormalities in very young children. Let us consider these seriatim.

The psycho-analytic view that character is determined by the age of 4 or 5. Leading psycho-analysts have asserted that the first four or five years of life are the most important in the fixing of character. Freud holds that 'the little human being is frequently a finished product in his fourth or fifth year'.³ Adler goes so

¹ *The Psychology of Sub-normal Children*, p. 143 (New York, 1920).

² *The Mental Defective*, p. 189 (London, 1931).

³ *Introductory Lectures on Psycho-analysis*, p. 298, 1922.

far as to say that 'one can determine how a child stands in relation to life a few months after his birth'.¹

It is not my wish to underestimate the importance of the first few years of life, but rather to stress it. It seems, however, impossible to state, on the evidence we have before us, that the first four to five years of life are more important than, say, the years of adolescence, or that they are decisive for later development.²

The Freudians have certainly shown that in many cases some experiences of the earliest years may continue to exert a profound influence on the life and character of the child when he grows up, even though he may have forgotten those experiences. It may also be admitted that, if bad relations are set up between child and parents in the first few years, those relations may be fixed so that the parents' unaided efforts to change them later may be futile.

But this is not to say that the child is a 'finished product' and impervious to all influences. And the record of many Children's Homes, Reformatory Schools, and Child Guidance Clinics show that the character of a child may be decidedly changed when he is moved out of the family environment as late as 10 or 12 years of age, or even later.

Decided changes are often noted in children who enter an infant school at 5 ; 0 or 6 ; 0 when the home environment has been unsatisfactory.³

It is certainly not proved that if a child suffers from an injurious social environment, or erratic and foolish discipline till, say, 5 or 6, but enjoys a favourable environment thereafter, it is necessarily more handicapped than a child who has a satisfactory environment till that age, and then comes under wrong discipline or vicious influences continuing through the unstable and suggestible period of adolescence.

In any case it seems unnecessary to make extreme statements about the absolute fixation of character by the age of 5 or 6. It is enough for our purposes if we admit that this early period is probably far more important for future development than was at one time thought.

The attempts to test intelligence at 6 or 12 months. A second influence that has proved a powerful stimulant to infant psychology is the attempt to press back the testing of intelligence earlier than

¹ *Understanding Human Nature* (translated by W. B. Wolfe), p. 42.

² The next four paragraphs are partly quoted or paraphrased from my book, *The Difficult Child and the Problem of Discipline*, Chap. III (Methuen, 1940).

³ Dr. Susan Isaacs, herself a good Freudian, testifies to this : see her section of *The Educational Guidance of the School Child*, p. 68.

3 years, the lowest age limit of the original Binet tests, and to set up norms for various aspects of development in the first few years. The valuable pioneer work done by Dr. Arnold Gesell provided criteria and tests which are suitable for infants of 9, 6 and even 4 months, and afforded some evidence of their correlation with normal mental development.¹ Dr. Gesell gives a considerable number of cases in which two or three months of retardation (or advancement) observed at 9 or 12 months of age, were followed by a year or so of retardation (or advancement) observed at 5 or 6 years of age with proportional amounts at 10;0 or at 15;0. Mental deficiency in some cases proved detectable at a very low age by appropriate tests: though in other cases continued observations showed an increase or decline in the Development Quotient, as he prefers to call it.²

The definite relation of such tests to later estimated intelligence, however, needs much more detailed study. Gesell himself points out that occasionally one finds a child whose subsequent development belies the prognosis at 0;6 or 0;9. Further researches should show what particular tests, usable in the first year, are reliable as indicators of future general intelligence; and no doubt, as I shall show later, some of the present individual tests for given ages will need to be modified or abandoned. For this, the daily study of infants in the home environment is again necessary, for this reveals that some tests are too dependent on the mood of the moment to be reliable clinical tests for children only seen at stated intervals and by a relative stranger. That the personality of the tester and the manner of testing or the choosing of suitable times are important is strongly suggested by the great differences in the correlations, obtained by different investigators, between I.Q.s estimated at 6 or 12 months and those of the same children when a year or two older. Thus Dorothy K. Hallowell, after testing and re-testing 436 infants (of whom 86 were under 1;0 and 130 between 1;0 and 2;0 at the time of first testing), found remarkably similar I.Q.s given by the two testings, with intervals usually between 6 and 24 months and often longer. The infants under 1;0 were as consistent as those between 1;0 and 3;0.³ Miss Hallowell

¹ See *The Mental Growth of the Pre-school Child* (New York, 1925).

² Dr. Gesell stresses this further in his latest book, which comes to hand as I revise this chapter (*Biographies of Child Development*, by A. Gesell and others, London, 1939). He points out that Mongols especially are likely to fail to maintain their early scores; a development quotient of 50 at 6 months may change to one of only about 15 at 5 years, owing to arrested development. In spite, however, of many atypical cases, which he describes in his book, he states that ten years' further experience has not dulled his faith in the possibilities of clinical prediction (p. 11).

³ See *Jour. of Genetic Psych.*, Vol. 40, p. 406 (1932).

used Gesell's tests for the children under 1 ; 0 and Gesell's supplemented by some of her own and Stanford-Binet Tests later.

On the other hand, in one recent inquiry in which a set of tests largely modelled on those of Gesell were used with a group of sixty infants, the correlation obtained between the first and fourth quarters of the first year was only 0.28, and by the end of the third year the correlation with the early tests had disappeared. A similar inquiry on twenty-five infants showed practically no correlation between scores in the tests at 0 ; 6, 0 ; 9 or 1 ; 0, and performance in the Binet tests about four years later.¹

A later inquiry on 123 infants showed that a correlation of 0.46 between Gesell tests at 0 ; 6 and the Binet test results at 3 ; 0. But when five selected tests for 0 ; 6 were combined in certain ways, the correlation rose to nearly 0.8.²

Such differences between various testings may have several causes: some tests are undoubtedly more valid than others, and some need eliminating. Then there is the great variability in the infant's mood and fitness at this early age, necessitating repeated tests at different times.

In some of these early tests, furthermore, much depends on individual judgement as to whether the test is passed or not. Also it may be quite possible to have a crude set of tests which will distinguish a mental defective from an average child, but which will not differentiate clearly between a large number of children whose intelligence is more nearly on a level. There is no doubt that a great deal of detailed work remains to be done. The main work is still the testing of tests and the discovery of those which give the best prognosis, which can be most objectively scored, and in which there is least variation in scores for a given mental age and according to the mood or condition of the infant. It is probable that repeated testing at intervals of a week or two and the averaging of all results would have given much better correlations between results at 6 or 9 months and at 18 or 24 months. It has indeed been found that even with children of 11 ; 0 or 12 ; 0 I.Q.s may vary by as much as 24 points in a series of six fortnightly tests, the average variation for nearly a hundred children being 10 points.³

Detailed reports on the performance in the earliest months on

¹ See art. by F. L. Goodenough, in *Handbook of Child Psychology*, p. 323 (edit. by Carl Murchison, 1933).

² V. L. Nelson and T. W. Richards, 'Studies in Mental Development, I', *Jour. of Genetic Psych.*, Vol. 52, p. 323 (1938). I have further discussed tests for the early years in *Intelligence Tests for Young Children* (Methuen, 1945).

³ See A. G. Rodger, 'The Application of Six Group Intelligence Tests to the Same Children and the Effects of Practice', *Brit. Jour. of Educ. Psych.*, Vol. VI (1936).

infants whose intelligence quotient at 12 or 15 years is known, should be of special value in estimating the prognosis value of these early tests. With the five children specially studied in this book, for example, the later intelligence quotients (from about 3 ; 0 to 12 ; 0 or 15 ; 0) are known to be from about 125 to 145, as tested by the Binet scale, the Porteus Maze Tests, Analogies, Reasoning and other tests given by Burt in his *Mental and Scholastic Tests*.¹

In using some of these early tests I have also found enormous variations in the performances of a particular child in different tests at a given age. Thus, a child of, say, 12 months would be able to do some of Gesell's tests for two-year-olds, and yet fail in some of those prescribed for its own age of one year.

Again as to invariability, one might think that a reflex would be as invariable a response as any. If produced by a given cause on one day, we should expect that it would be produced by the same cause on the next day in the same infant ; and Gesell gives the eye-blink response to sound as a test of 4-month level. Yet even reflexes are not such reliable tests as they might seem, as is shown by some experimental tests of the eye-blink reflex in response to a sudden loud noise, made on one of my little girls at 6 months. The remarkable fact emerged that, at this stage, with exactly the same stimulus, the eye-blink reflex may occur for a few times and then cease, and then recur again : it may occur nearly every time in about a dozen tests one day and in only one or two or even not at all on another day, and so on with no apparent cause of variation.² The common definition of a reflex as an 'invariable response', &c., is misleading, especially at these early stages, and the testing only two or three times of this reflex in a strange child at this age may be quite unreliable. But of course no tester relies on one test, and Gesell, for example, gives thirty-eight tests as suitable for the age of 1 ; 0. The one child of my own whom I tested with Gesell tests gave results which are in fairly good agreement at different ages. Here is the performance on Gesell's tests of my daughter Y whose I.Q., tested later by Binet tests at ages 2 ; 9, 3 ; 4 and 3 ; 9, worked out on the average

¹ In a recent book (*Biographies of Child Development*, by Arnold Gesell and others, 1939) Gesell reports on the development in later childhood of thirty children who were tested during their first two or three years, and reported on in his *Infancy and Human Growth*. In addition, over fifty new cases are given. Unfortunately for the determination of the validity of individual tests as prognosis of later intelligence, most of the relevant details are not given. Gesell emphasizes that he is concerned primarily with development and growth in various aspects, and not merely with the prognosis of general intelligence ; and his selected cases are not the most typical.

² Full particulars are given of this experiment in the chapter on Reflexes, p. 138.

at about 145. Her Development Quotient by Gesell tests is as follows (I may add that I tended to prefer those tests for which no special apparatus was required):

Development Quotient by Gesell Tests

At 3 months	.	.	D.Q. — 140	No. of tests tried—26
" 4½ "	.	.	D.Q. 140	" " " " 14
* " 8½ "	.	.	D.Q. about 125	" " " " 38
† " 1 year 4 months	.	.	D.Q. " 120	" " " " 9
" 2 years 3 "	.	.	D.Q. " 130	" " " " 14
" 2 " 9 "	.	.	D.Q. " 145	" " " " 14
Average D.Q.—136				

The results are represented also in Graph 1.

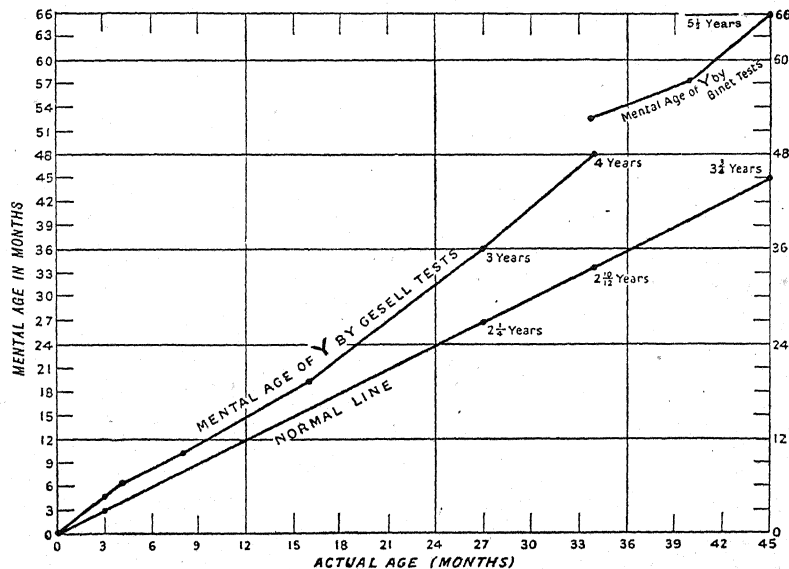
* The child was troubled with teething at this time, which almost certainly lowered her score.

† The tests used at 1;4 were only nine in number, and confined to tests prescribed for 1;6. Hence they are ignored in calculating the average I.Q.

This result interested me especially because Gesell states that he found it harder to diagnose in the first months intelligence well above the average than well below.

GRAPH I

SHOWING MENTAL AGE OF CHILD Y FROM THREE MONTHS BY GESELL AND BINET TESTS



One of the problems in devising suitable tests for general intelligence is to know how to form some standardizable measures of

that general activity and lively responsiveness which seems especially to distinguish the bright from the dull infant under 12 months. Gesell himself indeed finally concludes that mental superiority in early infancy may express itself not so much in acceleration of behaviour as by its diversification, by 'alertness' and 'drive'.¹

(c) *The appearance of special abilities.*² Another problem is to decide what special abilities are appearing even in the first year or two, which have to be allowed for in making our estimates. We know, for example, that at later ages some defectives appear to have remarkable abilities for arithmetical calculations, for music, or for drawing.³ And yet drawing and simple calculations are used for tests of general intelligence, and properly so when included in a group of tests of varying types. Bühler and Hetzer, who emphasize the fact that they, like Gesell, are estimating several aspects of development and not merely intellectual progress, include as one test item smiling response to a smiling face as a test at three months' level: ⁴ this response no doubt should appear in a normal child of this age: but we must bear in mind that it may also appear in a low-grade mental defective: it is not itself a criterion of intelligence.

Of less practical importance, perhaps, but of great interest for the genetic psychologist, is the appearance of these specific abilities. It is generally agreed by authorities on the testing of intelligence of children of school age, that special abilities are much harder to detect at an early age than is general intelligence. It is thought by some that they do not usually develop before the age of 10 or 12. As Professor Burt says, special abilities and special disabilities 'often fail to declare themselves until a later age' than 10.⁵

Now this general fact is sometimes interpreted as implying that specific abilities do not even exist in the first years. We must distinguish between (a) active existence, (b) appearance or proof of existence by tests and performance, and (c) latent existence maturing sufficiently for functioning only at a later period.

Some special abilities, we already know, are occasionally found in conjunction with very low general intelligence; while high general intelligence may be accompanied by low specific ability in, say, drawing or music, in spite of the fact that drawing tests usually show a fair correlation with other general intelligence tests

¹ *Infancy and Human Growth*, pp. 395-6. This is emphasized again in his latest book.

² In this section 'special abilities' may be taken as covering either 'group factors' or more 'specific' factors.

³ See Leta Stetter Hollingworth, *The Psychology of the Subnormal Child*, pp. 128-9 (New York, 1925).

⁴ *Testing Children's Development from Birth to School Age*, p. 104 (London, 1935).

⁵ *Mental and Scholastic Tests*, p. 266.

when large numbers of children are tested. An adult imbecile of mental age of 1 ; 0 could pick out tunes on the piano.¹ My own child Y, whose development graph has just been given and whose intelligence quotient was about 140, and above that in linguistic tests, was below normal in drawing tests. (At 11 ; 0, by the way, and again at 12 ; 0 she was top or very near the top of her class in English, Latin and French, and bottom in drawing.) At 3 ; 5 her drawing of a man was decidedly inferior to the third-year standard given by Burt (*Mental and Scholastic Tests*). Furthermore, although Y was ahead of B in all points of linguistic development, she did not crawl until she was 0 ; 10½ whereas B could crawl at 0 ; 7. In language Y was still further ahead of A, yet A could crawl backwards at 0 ; 7½ and forwards at 0 ; 9. (Here and throughout this book my boys are indicated by A, B and C, and the girls by X and Y.)

Gesell describes a child of 5 years with an I.Q. of 140 and a mental age of 7, whose drawing was no better than that of another child of 3 ; 6.² Gesell also gives the records of a child of normal intelligence who had not learned to walk until he was 5 ; 0, though there was 'no neurological complication'.³

Evidence of specific abilities appearing in children of only average general intelligence in the second and third year is harder to find, and as to the first year, it is practically non-existent. The precocious musical or literary geniuses who revealed their ability at 3 or 4 years were very likely above the average in general intelligence also: some of them seem to have been. But with rare exceptions we have no reliable evidence of their abilities in the second year, and still less in the first. One remarkable exception is the record of a young girl who at adolescent age was a gifted musician and composer. At 4 years she composed her first piece of music. Thanks to the detailed notes taken by her father, we know that this girl at the extraordinarily early age of 1 ; 3 hummed a simple tune correctly, and at 1 ; 5 sang the notes of 'My heart is like a singing bird'. Her general I.Q. seems to have been about 150, but nevertheless this musical ability is specifically very precocious.⁴ The range of I.Q.s of my own children was from about 125 or 130 to about 145, but not one of them could sing a simple tune at 4 ; 0 or 5 ; 0!

Early appearance of special linguistic ability. The question may

* ¹ See R. J. Berry and R. G. Gordon, *The Mental Defective*, Plate II, p. 33 (London, 1931).

² *Infancy and Human Growth*, p. 225.

³ *Op. cit.*, p. 208.

⁴ See Terman's *Genetic Studies of Genius*, Vol. III, p. 340. Several further examples of specific precocity in music and drawing are given in Gesell's latest book, *Biographies of Child Development*.

be raised as to whether the special abilities really only mature much later on, or whether this appears to be so merely because we have not yet discovered the right means for detecting them at the earliest stages. Inclining as I did myself to the view that special abilities develop rather late, I was astonished when I first analysed my notes and drew up the following graph based upon the records of the three of my children on whom I made notes as to various linguistic phenomena from the first weeks. When *spontaneous* 'cooing' first appeared I tested carefully for the first appearance of the child's *responsive* cooing to the mother's 'cooing' or 'talk'. The various other phenomena mentioned in the graph—practising new noises, understanding some command, and so on—appeared in each of the three children in the same order. In the graph, the lowest line is that of Y, who first showed spontaneous cooing at the age of 4 weeks. The second lowest line is that of B, who showed spontaneous cooing at the age of just under 5 weeks; the third line is that of A, who did not show it till 7 weeks and is behind the others in all the other speech phenomena—practising new noises, first understanding of a simple word of command, onomatopoeic noises, imitation of word-sounds, use of the negative, two-word sentence, &c.

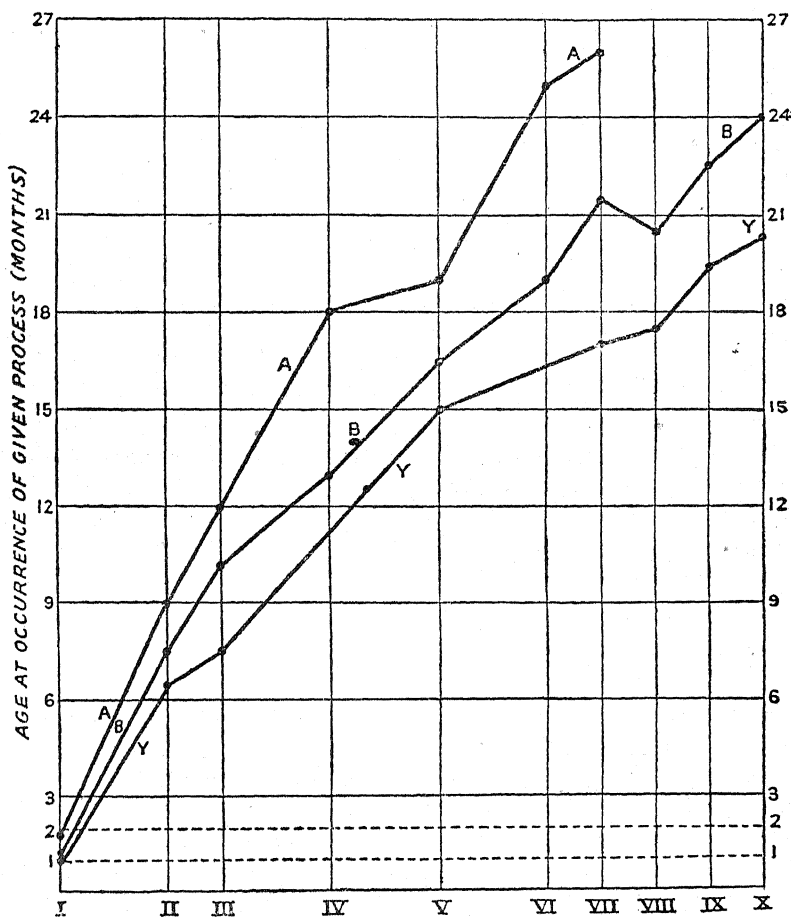
In this particular series, then, the order of precocity in speech, Y, B, A, was already indicated by, or I should say coincident with, the order of responsive cooing at 4, 5 and 7 weeks, respectively, and by the vigorous practising of new noises at the ages of $6\frac{1}{2}$, $7\frac{1}{2}$ and 9 months respectively. (I may add that notes of these early performances were made without the slightest idea at the time of their being correlated with later speech development.) Later Intelligence tests taken at various intervals from 3;0 to 12;0 showed the I.Q. of both B and Y to be about 145. A and Y were tested with Burt's Vocabulary Reading Test¹ at about the age of 10; again Y was decidedly ahead of A, with a Reading Quotient of about 140 against 110. B unfortunately was not given this vocabulary test.

These observations may, of course, be due only to a striking coincidence, or rather to two series of coincidences. Certainly, taken alone they prove nothing: but they suggest a fruitful line of inquiry which might establish the fact that some special abilities begin to develop even in the first few months if we could only learn what are the first clues and detect them early enough. Incidentally, we should be helping towards the building up of a battery of tests for general intelligence. It may be, indeed, that the development of language itself is in these early stages more

¹ See *Mental and Scholastic Tests*, p. 340 (London, 1921).

GRAPH II

SPEECH DEVELOPMENT OF THREE CHILDREN, A, B, AND Y, ILLUSTRATING PROGNOSTIC SUGGESTIONS OF EARLY TESTS FOR THE DEVELOPMENT OF SPEECH



Key to Graph.

- | | |
|--------------------------------------|------------------------------------|
| I. Responsive 'cooing'. | VI. Negative spoken as refusal. |
| II. Practising new noises. | VII. Two words used together (pos- |
| III. Doing one or two things at com- | sessive). |
| mand. | VIII. Two-word sentence. |
| IV. Onomatopoeic sounds. | IX. Three-word sentence. |
| V. Imitating word sounds | X. Asking name of everything. |

dependent on general ability than on as yet differentiated specific functions—a point we shall return to later. But I incline to the

view that some specific function already enters into language development in the first few months.¹

We already have reason to suspect that superior linguistic ability is the reason why girls surpass boys at nearly every age in the Binet tests. How far the earliest speech phenomena depend upon a specific linguistic ability and how far upon a general factor we do not as yet know. But from evidence given later in the chapters on language and on thought, it appears that as language became more and more expressive of complex thought processes (for example, involving two- and three-word sentences), the graphs of B and Y approached nearer to one another, and when the language was expressive of reasoned thought—as in the understanding of 'Why?' the use of the complex sentence, and so on, B sometimes surpassed Y at the corresponding age. As their Intelligence Quotients, whenever tested (over the period from 3 to 10 years), were about the same, it thus appears that specific linguistic ability is of considerable significance for these early performances.²

If the testing of general intelligence and specific abilities in the first two or three years is still only in a very primitive stage, still more is that true of the attempt to estimate the future strength of innate impulses, or instinctive and emotional tendencies—all the elements that go to make up temperament and disposition. The importance of these will appear in our next section.

The Child Guidance Movement, and early diagnosis of temperamental abnormalities. The third development in recent years which has further increased the interest in child psychology and has emphasized the need for fuller study of early temperamental development, is the Child Guidance Movement. This of course itself arose because a number of young children in the schools from the ages of 5 or 6 upwards were abnormal in their social relationships, difficult to handle for parents or teachers, rebellious, truant, thieves, and so forth. A large proportion of such problem children dealt with by the Child Guidance Clinics are eventually greatly improved. Though the causes of the troubles and the reasons for

¹ One of Gesell's collaborators suggests that one of the reasons why it is harder to detect superiority than deficiency in the first year is that latent language ability has hardly revealed itself by then (Dr. Helen Thomson in *Biographies of Child Development*, p. 113). Perhaps the three first tests I gave in Graph I will prove to serve this purpose.

² In the recent book referred to (*Biographies of Child Development*, p. 35) Gesell gives the record of a girl whose language development was 'definitely advanced at one year' (her score was that of the normal 1; 6). At 3; 0 her use of words was that of the normal four-year-old, and understanding of sentences was the average for 6; 0. Several other cases illustrate the relative independence of language development, as compared with motor development or adaptive behaviour.

the 'cures' are not so clear as they are sometimes thought to be, the frequency with which these problem children come from 'broken homes' is strong presumptive evidence that such a home is likely to have a harmful influence in many cases.

The influence of faulty discipline is also clear.¹ Burt found Defective Family Relationships about four times as frequent in the families of his 200 juvenile delinquents as in the 200 control group.² Dr. Gordon, however, in reporting on the Bath Clinic, writes: 'The frequency with which the broken home appears as a factor (50%) is remarkable, but important as this is, it must not be assumed that this is the only, or even the most important factor in any given case. In some cases it would appear to be all important, in others to have very little effect.'³ The examination of reports upon Guidance Clinic work indeed suggests that we have as yet very little knowledge as to how far the bad social habits of the children are due to environment or to innate traits, and that we need a much more detailed study of the instinctive and emotional development of those earliest years before children usually come into the hands of the Clinic. The Director of the London Child Guidance Clinic rightly complains that 'There is no agreement among those who ought to know as to how far a temperament is inborn and how far a temperament is acquired.'⁴

We cannot make many confident inferences about the causes of maladjustment from the records of cures in the clinics: for our knowledge does not seem much greater as to the reasons for improvement when it takes place. Indeed, remarkably similar percentages of cures occur in clinics differing widely in their methods. I have dealt with this topic in the book already referred to (*The Difficult Child and the Problem of Discipline*), but I may refer here to one finding, namely, that of Dr. Gillespie, who reports that in four different clinics he found the recovery rates approximately equivalent, 'yet the method of treatment employed by one clinic had been hydrotherapy, and that of another analysis'.⁵

It appears to me from a careful examination of the evidence that *possible* factors in causing improvements are (a) the change to a new environment, and especially the influence of friendly sympathetic persons at the clinic, (b) the changes taking place in

¹ I have discussed this and other allied topics more fully in *The Difficult Child and the Problem of Discipline* (Methuen, 1940).

² *The Young Delinquent*, p. 65 (London, 1925).

³ *Report on the Bath Child Guidance Clinic*, p. 41, 1933.

⁴ Dr. W. Moodie, in 'Child Guidance Principles in Educational Work', an address to the Training College Association, January 1932, published in the *Training College Bulletin*, February 1932, p. 8.

⁵ *Report of Child Guidance Inter-clinic Conference of Great Britain*, p. 60 (Child Guidance Council, London, 1937).

the home environment during the period of treatment in the clinic, (c) mere maturation (some of the cures take a long time), (d) improvement in physical health, and in some cases (e) special psychological treatment. At present, however, though a change to a new environment is undoubtedly successful sometimes when other means have failed, it is impossible to say which of these factors is the more important.

For example, we do not know at present how far mere maturation would have brought better co-ordination. How can we tell what number of these children would, in the course of a few years, have effected suitable adjustments even without special prescribed treatment? The schools have long been familiar with children who pass through 'difficult' periods. Then new capacities of self-control develop, aided no doubt by some wisdom gained through ordinary experience; and better adjustments become possible, though the attitude to one or both parents may be too fixed to change completely. Probably in the case of most children who improve while at a clinic the improvement would not have been effected nearly so quickly, if at all, if the child had merely continued as before at school or home; but it is difficult to prove this. The more cautious of the Child Guidance authorities recognize this. Thus Dr. C. L. C. Burns, the Director of the Birmingham Child Guidance Clinic, writes: 'It is difficult enough in the art and science of medicine to know when a result should be claimed as a cure, and it is all the more so when the condition is a complex one of behaviour and personality. It can only be roughly stated what degree of improvement or, preferably "adjustment", relative to the conditions at the outset of treatment, has occurred within the period of attendance at the Clinic, without claiming that it is necessarily a result of the treatment given.'¹

Dr. Burns, indeed, tells me that sometimes difficult children whose names have been put down on the waiting list of the Clinic are reported, before their turn comes to be treated, as having sufficiently improved to make a visit to the Clinic unnecessary.

We have always to bear in mind the possibility that some of these children are problem children chiefly because of innate disabilities, emotional instability or lack of co-ordination of impulses, and that in time by mere maturing these disabilities may adjust themselves. As Pierre Janet says, there are some types of nervous trouble which will run their course, whatever form of treatment is followed, and 'Happy the physician into whose hands the patient falls when she is about to recover'.

Of course the various possible factors in the cures mentioned

¹ See *Report on the Birmingham Child Guidance Clinic*, for the year 1934, p. 12.

above, some of which may be common to all clinic treatments, still leave open the possibility that certain special types of treatment may be particularly suitable for certain types of maladjustment. For example, some particular difficulties may be insoluble without the psychological examination of the child's individual past experience.

The question as to how far mere maturation and normal development would itself eventually bring about better social adjustments, or how far it would do so if the children were removed from an unfavourable environment, is intimately bound up with the question of emotional development to which we shall turn shortly; but first we must refer to another movement connected with and partly dependent on this recently increased interest in the first two or three years of life, namely, the Nursery School Movement.

The Nursery School and the training of the pre-school child. As in medicine the trend in recent years has been in the direction of increasing preventive medicine, so there is surely good reason for believing that the same tendency will and should reveal itself in dealing with problem children. The age at which children go to the Child Guidance Clinic at present is determined to a considerable extent by the age of entry to the schools which refer these children, and no doubt, even when children are reported from the home, many parents feel that they themselves ought to be able to deal, without external assistance, with children under, say, 5 or 6, even when they are very troublesome. As, however, the work of the Clinics becomes known, parents tend to bring children of pre-school age. Thus the Bath Child Guidance Clinic found that among their first forty cases no children of pre-school age came: whereas ten out of the next sixty were only 5 years or under.¹ To the London Clinic there came in 1933 sixty-five children under 5 years of age, out of about five hundred.² The more general institution of Nursery Schools may, and I think will, bring about a new situation. Here, also, we have opportunities for careful psychological observation on a great scale, of the development in the important period between 2 and 5. It is impossible to say how many difficulties in the dealing with children at school age might be avoided if their maladjustment received attention at an earlier stage, before it became definitely fixed. Here, however, we meet the very crux of the difficulty and the link with the immediate subject of this book. For when we consider what should be regarded as abnormal conduct or excessive emotional display on the part of the little child of 2, 3 and 4 years of age, we find a considerable depth of ignorance. We simply cannot say whether violent outbursts of temper, say, at 2 or 3, or extreme modesty,

¹ *Report on the Bath Child Guidance Clinic*, 1933, p. 39.

² *Report of the London Child Guidance Clinic*, for 1932-3, p. 16.

shrinking, timidity, and remaining aloof, are themselves signs either of some bad environmental influences in the home, wrong parental attitudes, and so forth, or are innate defects, or indeed whether they are not consistent with normal development. Nor do we know how they should be treated, or whether they should be treated at all.

We have so far no just grounds for assuming that what may be distressing to parents in the infant is a matter requiring the treatment of the psychologist or psycho-analyst. Within my own small family circle I can cite the following examples of apparently excessive emotional outbursts which were disturbing at the time, but were succeeded by satisfactory development later without any special 'treatment'.

(1) Occasional violent tempers in a boy of 1; 6 to 2; 6—at times rolling on the ground in rage—sometimes apparently merely through frustration of his self-assertion. This proved consistent with development into an exceptionally agreeable temperament in young manhood.

(2) Hysterical night fears in a little girl of 3—very troublesome over a considerable period; these proved consistent not only with a marked stability of emotion later, but with an unusual absence of fears of all kinds—darkness, animals, burglars, &c., except thunder and lightning—which developed especially after a 'thunder bolt' was seen to fall near the house she was in.

(3) An outburst of temper in a girl was noted at about 2; 6 in which she struck a maid with a knife and afterwards boasted, 'I did bleed her.' Yet this girl grew up to be the most sensitive to pain in others that I have known, as regards animals as well as human beings.¹ J. M. Baldwin also reports that his child E was rebellious and tempestuous and contra-suggestible 'in a marked way' in her second year; yet in her third year was 'as docile an imitator as one could desire'.²

We have already a few investigations to which we shall refer in later chapters, which give the frequency of various emotional reactions, in a small number of children, at a given age. But undoubtedly we need much more detailed analyses and reports on emotional and instinctive development in the pre-school age, together with hundreds of follow-up studies of the children in the schools and in their homes during the succeeding years with an attempt to correlate any subsequent development of anti-social tendencies with earlier innate characteristics or environmental influences.

¹ Quoted from *The Difficult Child and the Problem of Discipline*, p. 6.

² *Mental Development in the Child and the Race*, pp. 137-8 (New York, 1906).

Meanwhile we must not fall into the error of supposing that the early acquiring of a characteristically adult reaction is necessarily a good sign. Some investigators who have done valuable work in the study of infancy, have, for example, in a scale of development, given a good mark for a child of, say, 2;0 or 3;0 who shows no assertiveness against other children or signs of anger when his own desires were thwarted.

But how do we know that some such assertiveness and capability of temper is not actually an earnest of desirable strength of character at the adult stage—especially perhaps for boys? And may not entire absence of fear presage a lack of caution and a certain 'toughness' and indifference to future discipline?

Without endorsing the doctrine that the wild oats must be sown, we may surmise that if they are there, there is an optimal time for their sowing; and this may possibly be at a very early stage.

We shall return to this whole question of development and its stages in a later chapter. But first we must deal with another topic which bears closely on the interpretation of abnormalities in children's conduct as being due to environment rather than to innate impulses.

*Innate differences and abnormalities and their relation to character and behaviour.*¹ One of the fallacies which seem to be spreading among those parents who are trying to learn something of child psychology and how to bring up their own children, is that any difficulties of conduct in their children must be due to incorrect treatment on the part of themselves, the parents; and possibly in most Child Guidance Clinics this idea may have too great an influence. Certainly in much psycho-analytic literature, including the teaching of Adler and his followers, attention is, I think, concentrated too much on the influence of experience in producing anti-social conduct and abnormal emotional traits. In some half-dozen recent semi-popular books about children by medical men, I have found that the possibility of innate disabilities was practically ignored, and all differences in the behaviour of children were attributed to differences in training. It is especially surprising that some medical psychologists pay so little attention to what is after all a plain biological fact, namely, the fact of individual variation. If there is, for example, too great an aggressiveness shown by the child, one has to ask whether this is due, not to the home environment or repression in school, but rather to an excessively strong innate impulse of pugnacity or self-assertion in the child himself. Of course, even the consequences of the latter may be modifiable

¹ Several paragraphs in this section are paraphrases or quotations of parts of Chapter 2 of my book on the *Difficult Child and the Problem of Discipline*.

by appropriate treatment; but it is surely likely to need different treatment from aggressiveness which is largely due to environmental influences. As Professor Burt says: 'To know whether a spiteful boy is inherently ill-tempered, or only venting some half-hidden grievance; to know whether an erring girl is constitutionally over-sexed, or merely putting into practice what she has picked up from corrupt companions; to separate the excitability that is but a brief and transitory episode of some pubertal crisis from an excitability that has been present from birth and will probably last a lifetime—these are problems that continually arise in examining the neurotic and delinquent, and, could they be satisfactorily answered, would make a world of difference to the outlook and the treatment.'¹

Furthermore, we must bear in mind the question of maturation and of the possibility of the disappearance in due time of some abnormal characteristic by the maturing of other impulses which may counteract it. As to these matters again there is at present little evidence, and we must push back our inquiries to the first year or two of life if we are to obtain reliable evidence about abnormalities of endowment.

As to individual differences in emotional traits and innate impulses, we may start with the fact that, even in reference to fundamental physical matters, infants are born with marked individual differences. There are inborn defects, such as, in extreme cases, absence of vital parts of the cortex; there are inborn abnormalities in organs essential to life, such as those of the heart and in the efficiency of important glands essential to normal development; there are congenital anomalies of the central nervous system, deficiencies of various kinds which may lead to death within a few days of birth. Coming nearer to psychological matters, we find that even such a fundamental reflex as swallowing, which is so essential to life, shows individual variations. M. G. Blanton, for example, found that though the majority of the infants he tested would suck hard in the first few hours, there were several in whom swallowing was defective or almost entirely absent, all of these being children of mentally defective parents.²

If such variation can take place in a function so fundamental for life itself, useless and dangerous variations which even the passing of generations (in which such variations have proved fatal) have failed to eliminate, can we put any limit to the extent to which nature may allow variations in far less important traits—for example, self-assertion and self-submission, anger, affection, submission to

¹ *The Subnormal Mind*, p. 44 (2nd edition, London, 1937).

² See 'Behaviour of the Human Infant during the First Thirty Days of Life', *Psych. Rev.*, Vol. 24, 1917, p. 480.

discipline, suggestibility, &c. ? Here we have presumptive evidence which makes extremely improbable the causation of all differences of such traits by differences of environment, parental upbringing, school discipline, &c. In addition, we have a mass of further evidence as to innate differences. As regards sex, equally fundamental for the race, we find physiological maturing as early as $3\frac{1}{2}$ years in some girls, and as late as 22 in others.¹

Again, on estimating by means of a special apparatus the 'Motility' of seventy-three new-born infants (during the days 1 to 16), O. C. Irwin found that the most active infant was 290 times as active as the least!² Laughter and smiling in infants between 3 months and 12 months of age has been found to vary so much that even when all are in good health some laugh hardly ever, some a great deal.³ Some of the early differences shown by unlike twins, growing up in the same environment, afford further evidence.

As regards intelligence, we find extreme variations even in the earliest months, from idiocy and imbecility to an endowment which gives signs of a high degree of intelligence later.

To quote only one example in one family, there were three children of normal development (as tested at 0;4, 0;9 and 3;0, respectively, and afterwards at intervals up to about 6;0) and three defective children of development or intelligence quotients of only 35, 30 and 25 as tested at the ages of 0;10, 3;0 and 3;9, respectively, and then at intervals up to 10;0. One group of three evidently took after one parent, the other three after the other, 'the expression', as Gesell puts it, of 'the dominance of one ancestral strain'.⁴ At these very early ages it is incredible that special training accounts to any considerable extent for such enormous differences in performance in the same family.

In view of such individual variations in vital physiological functions and intelligence, why should other qualities which are not so vital to life and survival—some of the emotions and innate impulses, be exempt from such variations? Surely, then, we have strong presumptive evidence that on the emotional and impulsive side we shall also find great individual variations, and even extreme abnormalities in reference to every particular trait. This argument will seem to some to be indeed unnecessary; but as pointed out

¹ See Gesell, *Infancy and Human Growth*, p. 255, and L. S. Hollingworth, *The Psychology of the Adolescent*, p. 21.

² See *Jour. of Comparative Psychology*, Vol. 14 (1932).

³ See Ruth W. Washburn, 'A Study of Smiling and Laughing of Infants in the First Year of Life' (*Genetic Psychology Monographs*, Vol. VI, 1929).

⁴ See *Biographies of Child Development*, by A. Gesell and others, p. 26 (1939). For the first six years Gesell's own tests were used, and after 6;0 the Stanford-Binet tests.

at the beginning of this chapter, the point of view is constantly being overlooked by some writers on infant psychology, even if they do not, when faced with the fact of individual variation, take up the extreme attitude of, say, Adler and J. B. Watson, to whom all infants at birth seem to be pretty much alike. The latter, for example, after referring to imitation, pugnacity, anger, rivalry, resentment, sympathy, fear, acquisitiveness, play, sociability, shyness, and so forth, writes: 'We are forced to believe, from the study of facts, that all of these forms of behaviour are built in by the parent and by the environment in which the parent allows the child to grow up. There are no instincts. We build in at an early age everything that is later to appear.'¹

J. B. Watson may not be taken very seriously by most psychologists to-day: but something very like his doctrine had the support of Adler with his wide popular appeal. Adler writes: 'When the youngest children of different families bear so much resemblance to each other there is not much room for the belief in inheritance.'² And again: 'Individual psychology has tried to show the influence of the environment is always perceptible in *every mistake* made by the child.'³

The psycho-analysts generally admit important individual innate differences, not only in the strength of the Libido, but also, for example, in 'the capacity for sublimation', which, Freud says, many people possess 'only in a slight degree'.⁴ Nevertheless, psycho-analysts stress rather the influence of experience in determining later differences of temperament or character and in the setting up of neuroses. And to many people one striking coincidence between some marked trait and some early experience or some type of discipline is, when pointed out, apt to appeal more strongly than any argument based on innate endowment, because the latter is usually harder to describe and to give evidence for.

Of course, this underestimation of the importance of innate endowment is not shown by all medical psychologists or others specially concerned with the treatment of problem children, delinquents, neurotics, and so forth. There is a substantial body of moderate opinion which recognizes the importance of both types of causes; which opinion, however, through the very fact of being less extreme, attracts less attention. It is summed up in words which I take from a useful book by Dr. R. D. Gillespie: 'Some degree of personal abnormality may fairly be said to precede any mental breakdown.'⁵ To suggest that slight innate abnormalities

¹ J. B. Watson, *Psychological Care of Infant and Child*, p. 23.

² *The Education of Children*, p. 129 (London, 1930).

³ *Ibid.*, p. 126.

⁴ *Introductory Lectures on Psycho-Analysis*, p. 291.

⁵ *The Mind in Daily Life*, p. 163 (Methuen, 1933).

may give rise to trouble if subjected to severe environmental strain while persons with some marked abnormalities may carry on satisfactorily if in a specially suitable environment, is only to make more explicit Freud's own statement that the ill consequences of repression depend on the relative strength of the conflict to the innate strength of the nervous system of the particular individual.¹

Again, in spite of certain clear correlations between delinquency, or undisciplined conduct, or neurotic tendencies, with certain types of adverse environment, we know that many survive such an environment without disaster. Among Burt's 200 juvenile delinquents 58% of the delinquents came from homes in which there were defective family relationships; but so did 26% of his non-delinquents: 8% came from 'drunken' homes—but so did 3% of his non-delinquents too—and had (so far at least) survived it. Also 39% of the delinquents came from homes not characterized by defective discipline: while of the homes of non-delinquents, 6% were found to be 'vicious' and 12% ill disciplined.

Burt concludes that nearly half of his 200 delinquents had 'profound and widespread instability of emotions' as an inborn defect: whereas this was only true of 10% of his non-delinquent control group. His evidence indicated that some innate factor was the major cause of delinquency in 36% of the boys and in 41% of the girls.²

An American investigator, Dr. H. D. Hirsch, who made a detailed analysis of the home conditions and the personal characteristics of 604 delinquent children, found that 65% of them suffered from 'major emotional personality or mental deviations from the normal'.³ He holds, indeed, that the broken homes and unfavourable surroundings in general are in large part a result of the constitutional make-up of the parent or parents, which tends to be inherited by some of the children. Nearly half of his 600 delinquents came from unbroken homes: and only 22% of the siblings of delinquents were themselves delinquents.

It seems probable that as a rule more than one influence is

¹ This is a paraphrase from memory of a statement in, I think, Freud's *Introductory Lectures*, which I cannot locate again. But in searching for it I find a closer parallel in *Freud's Collected Papers*, Vol. I, p. 143 (New York and London, 1924), in the paper on 'Heredity and the Aetiology of the Neuroses'. On p. 154 Freud sums up his position at that time by saying: 'As for the neurotic heredity, I am far from being able to estimate accurately its influence in the aetiology of the neuroses. *I admit that its presence is indispensable in serious cases* [my italics]: I doubt whether it is a *sine qua non* in mild cases, but I am convinced that neurotic heredity alone cannot cause a psycho-neurosis if the specific aetiology of the latter, premature sexual stimulation, be lacking.'

² *The Young Delinquent*, p. 605.

³ See *Dynamic Causes of Juvenile Crime*, p. 237 (Cambridge, Massachusetts, 1937).

at work in causing juvenile delinquency or the 'problem' child at a younger age.¹

It is not my concern here to minimize the importance of doing our utmost to improve environments: but only to emphasize the fact of innate individual differences and the influence of such innate factors. Summing up, we may say that the facts suggest the following: that some children may be such by nature that they will become problem children whatever their environment may be: at least with our present knowledge of how to deal with them. Others will win through even in unfavourable environments and with unwise training. The rest, probably the biggest group, will develop well or ill according to their own environment and training. In our present state of knowledge we cannot say what proportion each of these three groups is, nor how to detect them at an early stage.

If we grant the fact of innate individual differences in temperamental and character qualities and the importance of these from the point of view of normal development or the making of a problem child, we have to admit that much more exact information is needed about the early signs of later developments: and for this we need first a more thorough analysis of early characteristics, the exact noting of the first appearances, and their correlation with other traits at the same period and in succeeding years. This is so difficult and so complex a task that we require for it the daily observation of the development of the same infant in the home as well as the 'cross-section' studies of groups of infants at various periods. In the next chapter we shall consider this question of methods of study.

Note on Heredity.

This is a big and fascinating topic though a delicate one for a father to discuss. In any case this book is not the place for it, since it would require a record not only of the children but of the parents, or of grandchildren at a corresponding age. It may, however, be worth while calling attention to the fact that biographical studies could contribute many facts of value. I can exemplify this by records of one of my daughters at a later age than those covered by this book. This girl was much less talked to and played with by myself than were A or B, yet she showed far more resemblance to her father in certain ways of thought, though more fluent and ready in speech than myself. Time and again a remark by another person has led to similar and simultaneous comments by her and myself, sometimes a quite out of the way word or phrase springing to our minds at the same moment. A highly specific

¹ Burt stresses this point. Compare also the records for 234 children at the Geneva Clinic (de L'Institut J. J. Rousseau) given by M. Loosli-Usteri in *Les Enfants Difficiles* (Neuchâtel, 1935).

resemblance appeared also in the sense of humour ; certain types of things which do not strike other members of the family, I can be sure she will see from precisely my point of view.

Other highly specific temperament traits which appear in the mother (or father) and in some but not all of the children, and which it seems impossible to explain by different environmental influences, have strengthened my belief in the great importance of innate and hereditary elements ; though without the detailed evidence I cannot expect this to carry equal conviction to the reader.

CHAPTER II

Methods of the Study of Infant Psychology

The methods of studying young children are very various. One may experiment or use observation only, and for either the help of the cinema may be enlisted. Tests of intelligence or of special abilities or of emotional reactions to certain stimuli may be made on large groups of children of given ages. Single children, twins or groups may be observed over a period in reference to some particular type of behaviour, or of language or thought ; and to studies of groups various statistical methods may be applied. Finally, by the biographical method the development of the whole child may be recorded from the earliest days.

Each of these methods, as we shall see, has its own particular advantages, and all, it seems to me, are essential for the thorough study of the psychology of infancy. They will all be drawn upon in this book.

The method adopted. My own contributions to the facts of child development are chiefly of the biographical type, with some intermingling of experiment. They were obtained by the observation of my own five children from birth up to adolescence, but particularly during the first few years.

In the earliest months observation was usually made daily, and in some cases almost hourly for the first few months. For example, on the boy B, on whom more notes are quoted than on any of the other children, not only did I endeavour to be present at most of his meals every day, but I spent many hours in the nursery with him. I frequently accompanied him on his outings even during the first few months, and later, when he could toddle about, took him for walks and played with him in the garden.

Great pains were taken to write down observations immediately afterwards or as soon after as possible, when memory was clear and exact.

In this book my three boys are indicated by the letter A, B, C, my two girls by X and Y. Alphabetical order must not be taken to indicate the order of birth. D indicates my eldest son's little boy. The great majority of the notes quoted were made upon B and Y, though there are many comparative observations on the other children, more particularly for certain special topics ; but even where notes are quoted on only one or two of the children, observation of the others was really valuable on these same matters. The observations on the earlier children gave me a general impression

of child development so that many things not quoted remained in the mind, and were a valuable check upon observations upon later children. On the other hand, observations on the children born later were again a check upon earlier observations, and notes of behaviour which seemed unusual in the earlier children could be checked by the later. In particular notable things—matters of special comment or observation—stood out better when there was a background of general familiarity with the development of several children.

All the children thus served as some safeguard against the danger of taking an exceptional fact as a general one: and the great individual variations among the five often made this an effective check. Of course they were not taken as an adequate basis for generalization; there is no suggestion of that. It will be found that constant comparisons are made: first, with the observations of other trained observers who have made biographical studies of infants in the first three to four years; and secondly, with numerous studies of infants by the cross-section method. Of the former kind may be mentioned the valuable records of Preyer, Darwin, Stern, Sully, Miss Shinn, Mrs. Moore, S. V. Dearborn, Major, Vilhelm Rasmussen, Mrs. Fenton and Dr. Ischikowa. On many points I have been able to quote confirmation from some at least of these careful observers. The number of biographical studies of infants is steadily growing, and already some points of complete agreement are appearing. For example, among seventeen of such studies in which nearly a score of items of motor development are dated each by several of the biographers, the same order of appearance is given, though individual ages for the various phenomena vary considerably.¹

Secondly, I was fortunate in having the help of several friends and former students of mine, all with a sound training in psychology, who kept detailed comparative observations on their infants on certain topics, about which I sent draft copies of my own notes.² In the important and difficult problem of sex-development and of the relation to parents and the evidence of preferences for one parent, or of an Oedipus complex, this circle of collaborators was widened to over twenty, nearly all teachers or advanced students of psychology.

All the collaborators on these special topics were told that their reports would be strictly private to myself, and would only be

¹ See summary by Mary M. Shirley in her article, 'Locomotor and Visual-Manual Functions in the First Two Years', *Handbook of Child Psychology*, edited by C. Murchison (2nd ed.), p. 247.

² My thanks for valuable help in this way are due to Mr. H. P. Williamson, Mrs. H. Barber, Mrs. M. E. Brash, Mrs. A. L. Harrison, Mr. and Mrs. H. B. Lawson, and to my colleague Mr. A. E. Chapman.

published anonymously : and my own observations in these matters are partly included under these anonymous reports. Hence we were all able to be frank in a way which might be difficult in individual reports separately published.

Finally, my own observations and psychological ideas on particular points are constantly checked by parallel records when they exist, of groups of infants studied at a particular age for a particular purpose ; for example, reflexes and other responses of infants in the first month, emotional reactions in the second and third year, the vocabulary and other language studies of two-year-olds, and so forth. Studies of this kind are now fairly numerous.

There are indeed some ways in which a detailed study even of one or two infants might be decisive if it were absolutely dependable. Thus (1) it can show at least how certain things may develop in some infants under certain conditions ; (2) it may demonstrate that a given process x may occur long before y and so prove that x cannot be derived from y or be necessarily dependent upon it ; (3) it may show that various impulses, a , b and c , are innate in a few children and so show that at least we cannot assume that in other children they are acquired by experience ; (4) more effective, perhaps, than any of these is the demonstration of individual differences in the midst of similar environment and methods of training. It so happened that my five children showed very striking individual differences as regards both special abilities and interests and in temperament.

Individual differences in the children studied. Marked differences in linguistic development have already been exemplified (see Chap. I, p. 12) and equally great differences appeared later in special interests. The differences, however, which it is probably most useful to illustrate, are those in temperamental traits. When the youngest child was approaching adolescence I filled in for each child part of a report form on Temperament Traits which I had drawn up.¹ The instructions for the first section of the report run as follows.

Most Striking Qualities or Characteristic Types of Behaviour. Several may be given under the heading, underlining those which are marked. Suggested terms : Co-operative, friendly, popular, aggressive, dominating, taking the lead, submissive, timorous, indifferent, sympathetic, protective, excitable, placid, cheerful, morose, obedient, conscientious, impulsive.

Taking this Report Form, I marked for each child the five most characteristic qualities, during their middle childhood and early adolescence, with the following results. (The letters a , b , c , are used to indicate the qualities, but *not* in the order given above.

¹ The Report Form was published in the *Brit. Jour. of Educ. Psych.*, Vol. X, 1940, with an article under the title, 'The Specific Nature of Temperament Traits and a Suggested Report Form'.

The children also are rearranged in a new order and do not correspond to A, B and C, X and Y as used throughout this book.)

An independent list made by another person who knew all five extremely well almost exactly coincided with mine.

The most striking qualities of each of the five children studied.

Qualities : a b c d e f g h i j k l m n o p q r	
Child 1	g k o p q
" 2	a b c d f g h i j k l m n o p q r
" 3	d f g h i j k l m n o p q r
" 4	c h i j k l m n o p q r
" 5	g h i j k l m n o p q r

The great differences between the five children are obvious. Note the child 2 alone has *a, b* and *r*; No. 3 alone has *d, f, j* and *n*; No. 4 alone has *h*, and No. 5 alone has *m*. It is true the main qualities for No. 1 are all down for at least one other child, but the combinations are very different; No. 2 has only one of No. 1's; No. 3 has only one, while No. 4 has three, *k, p* and *q*, and No. 5 has three, *g, k* and *p*.

No one quality is marked for all the children: and the only quality down for four of the five children is *k*, which was cheerfulness.

We may approach the matter in a different way and consider each quality in turn. In the report form referred to, I also suggested marking a child for each quality on a five-point scale, A, B, C, D, E—A meaning a very intense and unusual degree of the impulse or quality, E almost complete absence of the trait, C an average strength judging from children in the mass, B and D being intermediate. On such marking I estimated the following would be the scores for my own five children:

Qualities : a b c d e f g h i j k l m n o p q r	
Child 1	C B B D E D C B B C A E C C A A A B
" 2	A A A E D E E C A E B E E E B E A
" 3	E E E A A A A C E A D C A A B/A D C E
" 4	C B B E E D B B C C B E D B C B A C
" 5	E D B C C B A B B C A E B B B C B C

It will be seen that every quality except *h, k, l* and *p*, occurs in both extreme degrees (A and E) among the five children, and *k* and *l* are almost opposites, so that the scores necessarily resemble one another: even so, *k* scores range from A to D. That is, fourteen out of eighteen qualities occur in both extreme degrees. The marked difference of types among the five children has indeed been spontaneously remarked upon by a number of intimate friends: and these differences were no doubt lucky ones for a child psychologist!

The need for biographical studies. The frequent reference in this book to cross-section studies of groups of infants will show the importance I attach to work of that kind, especially to those

studies which cover a long period of observation during certain periods of the day—in hospital wards or nursery schools or in periodical visits to children in their homes. All, however, who have made continuous studies daily and hourly of development of individual infants living in their own homes will, I feel sure, agree, that such home studies are also essential for the establishment of a sound psychology of childhood. They have the supreme advantage of placing otherwise isolated events in their proper proportion by giving a background apt to be missed by the occasional observer or experimenter.

For example, the psycho-analyst who attributes great significance to the fact that a boy of 12 or 16 months is discovered playing with his genitals might have adopted a different attitude if in following the development of a baby from the first few weeks he had noted how the infant perpetually 'feels' things with his fingers, first feeling one hand with the fingers of the other, fiddling with his blankets and anything that comes within his reach, finally with his toes, in the midst of which general exploration of his body and perpetual activity of grasping, the genitals are bound eventually to come into the general play.

Or again, mere cross-section study of the temperament of a group of children at a given age, say, 2 or 3, will miss the record of those remarkable variations in the dominant mood of a particular period and the great apparent changes in temperament that I shall refer to in later chapters.

On the basis of laboratory observation of infants, J. B. Watson states that *imitation* plays a minor part in the acquiring of manual habits, because infants of 10–18 months do not imitate.¹ My own observations and experiments described later indicate a strong tendency to imitate at this period, but that the right imitatee is an important condition. A relative stranger may fail to secure imitation when the mother is imitated at once. Testing a child in a clinic for imitation would probably fail to reveal the latent period, which may result in an action being imitated some hours after it is seen (see Chap. X, p. 183).²

Even as regards the supposed stable reflexes, continued observation over a long period revealed decided possibilities of errors which may be made in their use as criteria of development in the first year. We shall see, for example, in the testing of a simple reflex

¹ *Psychology from the Standpoint of a Behaviourist* (2nd ed.), p. 339 (Philadelphia, 1924).

² Thus even two of Professor Gesell's usually most accurate observers state that the average two-year-old child does not imitate things which he remembers, but only those which are present to his senses (*The First Five Years of Life*, p. 251; Methuen, London, 1941), whereas our evidence shows that deferred or latent imitation may occur at about one year.

like the blinking of the eye at a loud sound, that when the testing is continued over a number of days the reflex may occur on one occasion and then not on the next occasion quite shortly afterwards, without any apparent explanation. The daily observation of the first months of infant life also helps us to avoid an error such as that of an able and indefatigable investigator like Charlotte Bühler, who actually puts the first distinguishing between strangers and familiar persons as late as 12 months.¹ Again, the daily observation of children alone brings out one or two very important facts about some principles of development; for example, the intermittent nature of development in accordance with which some functions may appear at an early stage, and then not recur for some weeks or months, and then recur again, and so on, with constantly decreasing intervals.² Sometimes these nascent functions seem only to occur under specially favourable circumstances, such as are afforded by the presence of a parent and the familiar surroundings of the home.

In the development of language and thinking one must be on the constant look-out day by day, over a period of weeks, if one is to trace the growth of a new concept, or the gradual generalization of a word: for example, 'Dickie' was first learned by B as the name of a canary; shortly afterwards it was used for all birds; then extended to flies; and finally to anything floating in the air—a dandelion seed, or a bit of fluff.

Piaget's well-known statement that the talk of little children under 7 is 'still ego-centric' and that the child 'feels no desire to communicate with others or to understand them', was based on observations of children of about the same ages playing in the same room.³ Even so, it was an overstatement; and when one studies the speech of a little child in the home one finds that communication begins long before this age—at least by 2 years of age, and as often as one might expect in view of the fact that the child is so occupied in learning.

For the study of the very beginning of dreams, one must also rely largely on the biographical study in the home. One must know the child intimately to discriminate genuine dreams from inventions, and one must be with the child constantly to catch the first excited and spontaneous recounting of the dream on waking or at the breakfast-table.

Only by continuous observation in the home can one also see

¹ *From Birth to Maturity*, p. 58.

² See Miss Shinn's *Notes on the Development of a Baby*, Vol. 1, pp. 247-8, for remarkable examples of the changes in the 'prevailing mood' observed in her niece from the age of one to 3 years.

³ See his *Language and Thought of the Child*, p. 126.

the great influence on the infant of the perfectly secure happy situation, and by contrast the disturbance of the emotional life by the unusual: while on the intellectual life the effect of the specially interesting, even exciting situation may be seen to raise the level of mental activity merely for the moment, just as the adult may rise at times to an unusual level of creative thought, a term which indeed may not unfairly be used for the first generalizations and grasping of relations by the infant. On the other hand, only constant observation of the same child can detect the rhythm in development, the alternating progress in different capacities or the periods of stagnation—the plateaux on the curve of advancement.

Parents as observers of their own children. It is often said that parents are apt to overestimate their own children (or underestimate them) and to read things into their conduct and speech which other people cannot see; and the question has to be raised as to whether parents may be competent observers of their own children. Undoubtedly the observations of a vast majority of parents are of little value on most important aspects of mental development. This, I should say, is chiefly due to the fact that they are not trained psychologists and especially not trained in the technique of child study, rather than to the fact that they are parents. Those who criticize the parents as observers are usually thinking of a limited range of topics, as, for example, moral qualities or temperaments. But over a considerable range of psychological topics, the prejudice on the part of the parents would be nil. What does it matter to a parent whether a spontaneous movement disappears entirely before voluntary movements begin; whether the eye-blink reflex in response to a passing sound happens invariably or is dependent upon bodily conditions; whether anger and pugnacity are inevitably and invariably associated; whether all word inflections appear simultaneously or whether specific cases are learnt while others remain unlearnt; whether inductive and deductive processes in thinking appear all at once or whether capacities for grasping relations are sporadic?

No doubt one constant danger of the parent as observer is that he should overestimate the intelligence of his children. I have repeatedly applied intelligence tests to all my children and references are made to these; but I cannot think of any important generalization or even observation in this book which would be affected if I had somewhat overestimated the intelligence of my children. Indeed, it works the other way, because in those particular topics where the intelligence quotient is important, as, for example, in thought, language, memory and learning, one of the main points that I constantly stress is the *early* appearance of many phenomena which are usually thought to occur only later.

For these earlier dates allowances must of course be made for intelligence quotients above the average; consequently I am somewhat weakening some of my own contentions if I have overestimated the intelligence of the children. As a matter of fact, independent testing of two of my children, one by Professor Burt and the other by the National Institute of Industrial Psychology, suggested that if anything I had slightly underestimated the intelligence in each case.

The greatest safeguard, however, against any error due to parental pride is the mere awareness of this danger and the objective attitude of the psychologist which a thorough training should have developed. In those special topics on which prejudice might affect judgement, parental prejudice is, in my opinion, less likely to occur than prejudice due to wholehearted devotion to some particular school of psychological thought.

Any one who reads such careful records as that of Miss Shinn (who as an aunt seemed just as devoted as any mother could be), of Preyer, Professor Dearborn and Mrs. Moore, will be assured of their competence as observers; even if they are human enough at times to let their admiration or affection flash out it does so openly and on points that are not vital. I am quite content that the reader should judge of my own attitude and impartiality, in the relatively small number of points where that could be important, from the way in which the topics are dealt with subsequently in this book.

There is, of course, one section of the psychology of childhood in which a parent's preference for one child compared with another may be very important: in such a topic, for example, as the influence of the position of the child in the family or the influence of special circumstances upon the relationship of a child to the parent. In this matter the co-operation and free discussion with the other parent is often a great safeguard, and I may say, first, that I had the advantage of that throughout my own studies, and, second, that these topics appear very little in my own book. They belong rather to the sphere of the parental discipline and education of the child.

On the general question as to the value of parental observations of children I would refer to several other testimonies. McDougall writes: 'A large part of my time, the most delightful and not the least profitable to my professional studies, was spent with my children, on all of whom I made detailed notes during their earliest years.'¹ Koffka, who is without the prejudices of a parent on this topic, writes eulogistically on the mother as a source of knowledge and emphasizes the fact that we must know the child as a whole.² Miss Shirley (whose valuable work on *The First Two*

¹ See *The History of Psychology in Autobiography*, Vol. 1, p. 208.

² *The Growth of the Mind*, p. 6.

Years, based on the study of twenty-five infants, I shall refer to later) attaches greater weight than I should to the observations of ordinary parents when acting under guidance and instruction with definite questions to answer. She found that practically all the reports of precocity made by the mothers of her twenty-five infants were confirmed in testing.¹

As to prejudice due to attachment to a particular school of psychological thought, perhaps a personal note is desirable. I started with the advantage of being attached to no such school. My notes began very shortly after my studies under James Ward, C. S. Myers and W. H. R. Rivers, and after prolonged absorption of the writings of G. F. Stout. I owe a deep debt to these for suggesting an attitude of mind in approaching psychology; but no one familiar with their writings will suggest that it was likely to lead to prejudice or dogmatism in matters of child psychology.

I began with a somewhat critical attitude towards McDougall's *Social Psychology*, but my debt to him is shown by the extent to which I approach the study of the conative and emotional aspects of the child's life in terms which he, more than any contemporary psychologist, helped to make common usage.

As to Freud's views on infancy which are discussed in Chapters XVII and XVIII, I may say that I was greatly attracted by the first of his writings to appear in English. I resented the prejudice that revolted against him merely because he wrote so frankly on matters of sex; and finally I published a brief book to expound some of his main ideas and to link them with general psychology.² I hope, then, I can be acquitted from prejudice against his views. In any case, a large mass of my observations were made before I had read much of either Freud or his critics about infant development.

Are the children of psychologists a selected type? We may admit (and hope) that there would be a general tendency for the children of the psychologist to be above the average intelligence, though this is of course quite consistent with some of them being below the average. The actual level can in any case be met by finding the I.Q. in each case, and bearing it in mind, especially in the dating of early appearances. Granted, however, such a usual superiority of intelligence, there seems to be no reason why we should expect any difference in the innate (instinctive) or the emotional tendencies of the children of psychologists on whom observations are made. We psychologists are men of like passions with others; also we have to bear in mind that the children are

¹ *The First Two Years*, Vol. 1, p. 28 (University of Minneapolis Press, 1931).

² *The New Psychology of the Unconscious* (Christophers, London, 2nd Edit., 1928).

also the children of the wives of the psychologists, who need not be, of course, and are usually not, of similar type. A friend who read part of this book in manuscript at an early stage suggests that through a careful upbringing a psychologist's children may not be representative. I should agree that psychology may be some help in the handling of difficult children,¹ but the discipline and upbringing of very young children—with which in this book we are concerned—are usually much more in the hands of the mother, and the handling of her children is more likely to be based on instinctive impulse rather than on psychology. Further, even granting that the home training may not be typical, in detailed studies one can indicate the kind of environment in which the children grow, and one can record the mode of development in that environment.

Even if the children of psychologists were of a somewhat superior type, either from the point of view of innate traits or of wise upbringing, it might be argued reasonably that these are needed if only as a counterblast to the sweeping generalizations too frequently based upon the study of a relatively few abnormal children attracted either to psycho-analysts or to child guidance clinics because they are so very difficult to deal with. Even the Nursery School, immensely valuable as I think it should be in the near future as a source of child study, probably tends to have a rather larger proportion of children troublesome to the parent than a truly representative group, for there is surely a greater tendency for the mothers to bring such children to the nursery school.

Finally, in the experimental and 'freedom schools' the children are more likely to be of a selected type: because 'problem children', who have proved intractable elsewhere, are apt to be sent there, or because it is chiefly parents of unconventional views as to the training of children who are likely to send their children to such schools.

The reference to freedom schools leads us to another topic, namely, the modification of the behaviour of the children by the atmosphere of the home and of the school and of the discipline applied. Dr. Susan Isaacs criticizes Stern because he bases his psychology of childhood on the development of children who were subject to discipline, and apparently an effective discipline. For example, Stern reports that one of his girls aged $3\frac{3}{4}$ was restrained by the mere expression of sadness on the mother's face when the child was naughty; and sometimes she gave herself a smack on the fingers at the request of the parent.²

This very quotation, however, shows first that Stern was suffi-

¹ I have discussed this more fully in *The Difficult Child and The Problem of Discipline* (Methuen, 1940).

² Susan Isaacs, *The Intellectual Growth of Young Children*, p. 11.

ciently candid to provide material from which his own conclusions can be criticized. Apart from that, surely these facts themselves are of value; and so far as similar conditions exist—as I imagine they do in the majority of homes—they are at least more typical of the development of most children than observations made in homes or schools of unusual freedom. To the assertion that such submissive behaviour could not be that of the natural child, I should reply that the affection of a child for a parent often seems so strong as to result in a wish not to do anything that would trouble the parent: and that such an affection in a child may be equally 'natural' as aggressive opposition to the parent's wishes.

More recently Dr. Isaacs herself has acknowledged the value of a mother's continuous study of her own child,¹ and has indeed made good use of the reports even of unknown mothers made to her as the regular adviser of parents in a weekly journal.²

In case the results of home observation are contrasted with those produced in the freedom of experimental schools, we must recall that such schools also have their decided tone and sometimes a very dominating individual at the head. To a great extent I believe such schools often owe what results they do achieve to the outstanding personality of the head of the school. This fact would account for the apparent collapse of the system when that personality is removed. To sum up, it is inevitable that any child must be subject to disciplinary influences of some kind from his fellow children, even if parents and teachers are believers in the utmost freedom for the children. Furthermore, in the 'Freedom School' the revolt of the children against stricter home training may actually be suggested and increased by the unexpected and novel freedom of the school.

In view, then, of the difficulties of exactly defining the influence of the adult environment, surely all studies of every type of child in every type of environment are useful; and it is possible that even the discipline of the type indicated by Stern's notes quoted above may bring out impulses in the child which are genuinely innate, and which may not be brought out even in the free atmosphere of a school which lacks a dearly loved parent.

Of course it would be of great interest if we *could* observe the development of a child isolated from all adult society, or even isolated from all human society, like Romulus and Remus; but even if that were possible or humane, it would not ensure us the revelation of all the 'natural' impulses of the child, for it would remove the essential stimuli of many responses. The same type of objection applies if we attempted to eliminate all our own influence

¹ See her Foreword to *Child at Play*, by M. Thorburn.

² See her article in the *Brit. Jour. of Educ. Psych.*, Vol. II, 1932.

on the child. We want to know how children react to all kinds of social surroundings, not how they would behave in the midst of persons who never spoke to or smiled at them or responded to them, but only just sat and took shorthand notes.

Observations—prepared versus unprepared. The question of prejudice leads naturally to an important problem at the outset of the study of an infant's development by a parent psychologist. Shall he note anything and everything he can as it occurs, even if he does not see the significance of it: or shall he prepare himself by a detailed study of earlier work and by the formulation of a large number of special problems to gather material? Each method has its own advantages and disadvantages. In observing my eldest child I found that, while any general training in psychology gave me a rough guide as to the main types of things worth observing—reflexes, innate dispositions, motor sensory co-ordinations, and so on, lack of concern with highly specialized questions and openness of mind as to what might prove important, led to the noting of many things of which I did not see the importance then, though I did later. Coincidentally with these early observations I began to read the remarks of other observers of infancy: and with the later children I realized the advantage of being able to observe and experiment more exactly in certain specific problems. If one can keep oneself open minded, the prepared attitude seems to me undoubtedly better: although it is particularly convincing when one finds confirmatory reports of some surprising observation, on looking over earlier notes on other children which have been quite forgotten. For example, none of the notes on language development recorded in the graph in Chapter I was made with any thought that they might yield such a regular and comparative sequence of events.

Experiments and observation. From the outset, however, one may use experimental methods. The weakness of some biographical studies is their reliance on one or two observations, e.g. as regards the first appearance of reflexes or smiles in response to smiles, of the use of words, and so forth. The danger of mere coincidence must be remembered: and repeated tests or observations should be made, with a record of negative as well as positive results. In some things experiment is essential: for example, no mere occasional observations could have demonstrated reliably at 4 months an infant's preference for colours at the warm end of the spectrum, as a special series of experiments did with one of my children (see Chap. XXII, p. 489).

Many examples of experiments will appear in later chapters, including such varied topics as reflexes, imitation, laughter and fear. The methods vary according to the problem at issue, and

will be better understood in their context than they would in a separate discussion of method as such. I would add here only one thing. After my presidential address on the Psychology of Infancy to the Psychology Section of the British Association at Bristol some one wrote to a daily paper protesting against the cruelty of experimenting on infants of one or 2 years of age. The suggestion would not, I am sure, have been made by any one who had seen either my own simple experiments or those of other experimenters—with one or two exceptions. At such an age, indeed, practically all the experiments such as are described here would be futile if the infant were fatigued or uncomfortable at the time, or even if it were not keenly interested. Indeed, by far the greater proportion of the experiments and tests during the first, second and third years were sources of entertainment rather than otherwise. My own children, from the first beginnings of language up to the age at which they could be given Binet tests, have often asked for repetition of experiments and tests. Even in the first year or two the added companionship of a father who is making constant tests lessens the frequency of that boredom which is the main abhorrence of a baby of this age.

The idea that through experimenting on one's child the natural affection of the parent is lessened is also, I am sure, ridiculous. If anything, it is likely to be increased, as one takes so much more interest in the babe than fathers usually do. Perhaps I may best clinch the argument of this section by quoting from a brief newspaper article which my eldest son wrote in reply to the above suggestion that such experiments and tests 'were unkind to the children'.

The psychological professor's child, the 'laboratory babe', has indeed a joyful infancy, full of variety. His father, investigating, say, the origin of laughter, prepares for him the most delightful surprises. At any moment 'Daddy' may appear wearing a cocked hat and blowing a whistle, or 'Mummy' may deliberately tumble down a bank in full view. Laughter is inevitable to the professor's child from the age, apparently, of 39 days onwards.

Besides their ordinary nursery, the professor's children are fortunate in possessing an extra room reserved for special occasions. Father calls it his 'study', but in it are some of the most fascinating of toys. The tests with which the psychologist seeks to probe the depths of his children's intellects are among the greatest joys of their lives, though frequently they give rise to little thrills of fear. These tests are most varied; puzzles, a hideous mask, Santa Claus, woolly caterpillars . . . anything may appear. The test usually ends, however, with the use of the box of sweets kept by the professor in his desk!

The child, from its earliest years, thus regards such a father as a play-mate. Indeed, the latter has been known to become so interested in a

game of trains or soldiers, that he has forgotten for the moment the need for psychological observation.

It is little wonder that in the case of more than one of his children the professor, as he reported at the recent meeting of the British Association, has found that the word 'Da-da' is used first not only as a name for him, but also as an expression of pleasure and the appreciation of entertainment.

The 'behaviourist' method and interpretation. In the earliest stages of child development we must, of course, follow a purely behaviourist method. Here extreme caution must be used in interpreting such behaviour. Especially is there a danger of reading too readily into certain behaviour the meaning it would have if such behaviour was that of an adult. Further, the *consequences* of actions are not usually seen by a mere baby and yet may be impressive to an adult. Thus it has been stated that at the teething period there is a marked increase in destructive impulses, whereas the only certain fact is that there is a strong impulse to use the growing teeth in biting; this may result in some destruction, but it is quite unnecessary to assume that destruction is intended.

It will be best to face the various problems of interpretation of behaviour as we study each particular type—the meaning of the earliest expressions of feeling, of apparent fears, and so on. But we may comment here on one general point raised by the behaviourist, and illustrate it by a preliminary discussion of early signs of fear.

It is impossible, of course, to be certain when fear is actually first felt. We can only note the first appearance of signs similar to those which adults make when they feel fear; or we may note the behaviour of children under situations which we imagine are likely to cause fear and then conclude that their responses are expressions of fear, even when they differ somewhat from adult expressions of fear. The limitations and dangers of these methods, especially of the latter, are obvious.

Some writers who assume that this or that produces fear do not say upon what principles they base this discrimination. Thus even Sully, who is aware of the dangers of misinterpretation, after remarking in his *Studies of Childhood* that reflex starting 'hardly amounts to fear', goes on to say, 'Fear proper betrays itself in the stare, the grave look, and in such movements as turning away and hiding the face against the nurse's or mother's shoulder, and sometimes in covering it with the hands. In severe forms it leads to trembling and loud shrieking. Changes of colour also occur. It is commonly said that great fear produces paleness; but according to one of my correspondents who has had considerable experience, a child may show the feeling by his face turning scarlet.

Fear, if not very intense, leads to voluntary movements, as turning away, putting the object aside, or moving away. In its more violent forms, however, it paralyzes' (p. 139).

Sully does not, however, say how he is sure there is 'fear proper'. Usually he, with others, would seem to use the first method I have mentioned, namely, interpreting by signs similar to those in adults; but this reference to 'turning scarlet' suggests a lapse into the second method of assuming, because of the circumstances, that it was fear that was felt.

In spite of the unreliability of these methods, the psychologist can hardly go beyond them if he is to talk about fear at all; and in spite of the special weaknesses of the second method, the probability that fear is experienced by the infant at least increases when the usual adult signs of fear are shown by the infant under conditions which are similar to those which arouse fear in some adults: and especially when similar reactions continue through childhood up to the time when fear can be reliably described by the child itself.

The behaviourist, I know, would solve the problem by studying and describing only situations and responses. J. B. Watson confesses to using the terms 'fear, rage and love' with hesitation, and says they are to be interpreted merely in terms of 'situation and response'.¹

Yet it is difficult to see on what principle the behaviourist at any rate *begins* to study and group these situations and responses together, except by their association with experienced fear, which involves introspection. For there are very different kinds of situations which seem to cause fear, and very different responses by different individuals to the same situations.

In view, however, of the uncertainty attaching to inferences as to early fears, it would be more accurate, at early stages, to speak of 'responses suggesting fear'; and, if in the chapter on Fear, for brevity I sometimes write 'fear was shown', it will be understood that the matter is one of probability and that the uncertainty of the method is not forgotten.

In considering the validity of our method, we have to recognize, also, the variety of responses to situations tending to arouse fear, or rather to 'danger situations', as Thorndike² and Rivers³ have so clearly pointed out; and, when adopting for a time the attitude of the behaviourist, one has further to recognize another fact—that, in adults, experience and inhibition or control exercise an

¹ J. B. Watson, *Psychology from the Standpoint of a Behaviourist*, p. 219.

² *Educational Psychology* (1920), Vol. I, pp. 60 ff.

³ *Instinct and the Unconscious*, Chap. VII, on 'The Danger Instincts' (Cambridge, 1920)

influence on some of the more obvious expressions of fear; most men do not hide their faces or run away at the sight of a ghostly object in a dark lane.

If, however, fear is truly an instinctive or at least an innate response, it is likely that there will be expressions common to all ages and not entirely repressible even by experienced adults; and it is those expressive movements which even the adult feels he cannot eliminate (and which by the adult can be recognized as accompaniments of fear), such as the dilated eye, the opened mouth, the gasping breath, the bodily shrinking or trembling, the muscular contraction and slight raising of hands and arms, mostly reflexes or responses resembling reflexes, which are the best criteria of fear in childhood. Another expression of apparent fear in childhood, that of loud screaming, seems to have continued as such in women more than in men.

The beginnings of language and the child's own statements as to its experience provide a new help towards our interpretation of his behaviour; but here again the greatest caution is needed because of our ignorance of the exact meaning the child gives to his words. These meanings themselves are built up in accordance with the child's behaviouristic interpretations of our actions. Thus the child B at the age of 4; 4 when he used the word 'naughty' was asked, 'What does naughty mean?' He replied, 'When you do something I don't want you to do, that's naughty.' These difficulties, however, seem to me difficulties varying in degree but not in kind from those in our understanding of the experiences of other adults; and the discussion of our interpretation of the behaviour and the language of other persons, and of its reliability, and even of the ideas of Solipsism to which it might lead, are clearly beyond our province.

CHAPTER III

Fundamental Factors in Mental Development : Maturation, Exercise and Physiological Conditions

The meaning of 'development'. The term 'development' covers various processes. It may indicate something regarded as merely quantitative, such as the simple increase in vigour of an activity ; or it may be used to designate the increase in stability and regularity of a function which has already appeared, as, for example, when the attempt to say a certain word is at first very insecure or at least only succeeds once in half a dozen times, but finally becomes perfectly regular ; or it may be used to cover new co-ordinations or combinations of processes, which previously worked only independently ; or again, it may mean the appearance of new elementary or even of new complex functions which never before occurred, as, for example, when a child for the first time imitates a sound made by its mother.

There are, of course, various combinations of these meanings ; and writers on mental development often seem to imply more than one of them at the same time. Nor must the distinctions I have drawn be taken as implying that I believe these are entirely independent and separable aspects of development. As Professor Arnold Gesell has pointed out, the idea of growth as meaning merely increase in size, is a purely theoretical one ; he himself thinks such growth never takes place without 'changes in configuration and organization'. 'Growth', he adds, 'always produces alterative as well as magnitude changes.'¹

In our present state of knowledge or ignorance of mental development it is indeed sometimes impossible to say whether what seems to be a first appearance of an entirely new elementary mental function is not really a new combination of two more elementary functions already developed.

Maturation. There is another term about the meaning of which we must be clear and which itself connotes a most important idea in psychology, namely, maturation. The increase in mental progress with increasing years is attributable to two causes, external and internal. When the increase in mental progress is due primarily to internal causes, that is, consists essentially in spontaneous growth arising from the intrinsic tendencies existing within the organism

¹ See his article on 'Maturation and the Patterning of Behaviour', *Handbook of Child Psychology*, p. 210 (Clark Univ. Press, 1933).

itself, we may use the word 'maturation' to denote it. Of course, one cannot divorce this entirely from the influence of the environment and all external stimuli; but as we shall see when we consider this idea more fully, the lines of development, the general nature of development, the various co-ordinations of elementary functions or appearances of new ones, seem to be determined to a very large extent by what the child starts with, and by laws of internal development which operate whatever the external influences may be, provided of course they are sufficient for at least moderate physical well-being. So far as that is so we say that these changes are due merely to maturation. An example may make the concept clearer. We have good reason to think the various factors involved in clear sight-focusing are not sufficiently ripe at birth to function adequately, though opportunities are there in the form of external objects at varying distances. Again, it is quite clear to any one who has studied a little baby in the first few weeks that it would be absurd to attempt to train it to hold a stick in its hand.

The concept of maturation is of course no new one. Long ago William James gave a dramatic and illuminating example. He prophesied that, if some widower left in charge of a baby of only a few weeks, would have the courage to cause blisters on the feet of his little boy to prevent him trying to walk for some months when he was apparently ready to make his first efforts, it would be found after a few months that, if these blisters were allowed to heal, the child would be able to walk quite well without having had any practice. In short, James maintained that the various centres concerned with walking would be ripening and that the amount of training and practice needed for the right functioning was very slight: much more depended on mere maturing. A much earlier example of a more naïve belief in the effect of mere maturation is given by Herodotus in his story of the Egyptian king, Psammetichus, who wished to know whether the Egyptians were really the most ancient of mankind; so he ordered two newborn babies to be isolated and reared without being spoken to, to see what language they would spontaneously speak. At the age of two, the story goes, they uttered entreatingly the word *bekos*, which the king discovered to be the word used by the Phrygians for 'bread'.¹

This whole question of the relative importance of maturing and of training is of wide significance in reference to both physical and mental development. The value of training has usually been uppermost in the minds of educators and the necessity for maturing relatively in the background until recent times. To this, however, there have been some notable exceptions, particularly Rousseau,

¹ See Herodotus, Book II, paragraph 2.

who held that until the age of adolescence we should do little but just let the child grow. More recently some daring teachers, believing especially in the importance of maturation, have tried new plans. Some years ago the headmaster of an elementary school in London deferred the study of arithmetic, holding that arithmetic was usually taught when the child's mind was not ripe for it. He therefore postponed all but very elementary number work until about 11 years of age and claimed that he got equally good results by the end of the child's schooling. On the other hand, it is claimed by some that a child must learn to pronounce French words with ease before adolescence if he is to speak the language well later on: and that no one can become an expert violinist if he defers learning to adulthood.

I mention these points merely to illustrate the important bearing this question has upon educational and other topics.

Now if we consider the beginning of life, we may recall Julian Huxley's saying, that much more of our growth takes place before birth than after.¹ Of course the foetus itself is receiving constantly some form of external stimuli, but at least we can surely assume that little in the nature of learning through training and exercise is taking place.

The problem of the relative importance of maturing and learning by experience has been studied also at the animal level. Thus in some experiments with young chicks it was found that maturation during the first five days seemed to be a sufficient explanation of the reduction and almost elimination of missing-errors in pecking, although under normal conditions practice efforts aided in this elimination.² It was also concluded that while accuracy in *total response*, including swallowing, seemed to be very definitely the result of learning, nevertheless, more mature chicks develop accuracy in this reaction more rapidly than the less mature.

My own attention was drawn to this problem particularly by the observation that one of my children showed a marked increase in efficiency in crawling immediately on being put down to crawl after a period when, owing to illness at 11 months, he had not been put upon the floor to crawl for about 4 or 5 weeks.

Experiments to test maturation. In recent years a number of experiments have been made to ascertain the importance of maturation in infant development: a few of the most significant may be cited here. J. R. Hilgard selected two groups of ten children each of the same age and sex (between 2;0 and 3;0) and of the

¹ See the article in *Marriage and Hygiene*, p. 19, quoted from Julian Huxley's *What Dare I Think*.

² W. U. Cruze, 'Maturation and Learning in Chicks', *Jour. of Comp. Psych.*, Vol. 19, 1935, p. 408.

'same initial ability in three skills—climbing, buttoning and cutting with scissors'. One group was given twelve weeks of special practice in these activities: but their superiority to the control group at the end of this period vanished after one week's practice by the control group. Of course the control group would be having practice in 'related' and supplementary activities during this time: but the author concludes, reasonably it seems to me, that here maturation was an important factor in the rapid equalling of the practised group by the control group.¹

Gesell made the following experiment on two identical twins 10 months old. From week 46 twin C was prevented from getting any special training in climbing and the handling of blocks for six weeks, while twin T was specially trained in these activities during this period of six weeks. It was found that the more mature but untrained twin immediately climbed unaided without any previous training, though at the earlier age T had needed help. Most significant of all, the trained child, at the end of this training period, continued chiefly to crawl in climbing, while the untrained C walked.²

It is reported that Albanian children, who are so bandaged during the first year that they cannot move hands or feet, when first set free are 'unable to hold anything', and yet, within a period of two hours, cover all the steps for which normal children require many, 'and finally are able to perform all the age characteristic tests'.³

One other experiment must be mentioned because it may seem to emphasize the importance of exercise and learning as against maturation. It was carried out on two infants from the age of one month by Mr. Wayne Dennis, who with his wife secured the care of two twins in a hospital.⁴

Great attention was paid to their physical health, and it was stated that this was thoroughly satisfactory. Their physical activities, however, and opportunities of learning hand and eye co-ordination or body movements were restricted to an extent which few, I imagine, would be willing to impose upon any child. Cruel, however, as the experiments seem, since they have been finished we may as well take account of the results.

No toys or objects with which the babies could practise their

¹ See 'Learning and Maturation in Pre-school Children', by Josephine R. Hilgard, *Jour. of Genetic Psych.*, Vol. 41, 1932.

² See A. Gesell and H. Thompson, *Infant Behaviour*, p. 315 (1934), or, for further details, the same authors, *Learning and Growth in Identical Twins*, *Genetic Psychology*, Monograph, 6.

³ See an inquiry by L. Danzinger and L. Frankl, referred to by Charlotte Bühler in *From Birth to Maturity*, p. 84.

⁴ 'The Effect of Restricted Practice upon the Reaching, Sitting and Standing of Two Infants', *Jour. of Genetic Psych.*, Vol. 47, Sept. 1935.

hand-grasping were introduced until they were 11 months old, though the normal child is busy playing with things from 4 or 5 months of age. They were even prevented from reaching for food, by placing their hands under a tightly held bib while they fed. To prevent practice in sitting the infants were kept almost continually on their backs in their cribs and never placed on their feet.

Testing in grasping a dangling object began at 0;8. Now a dangling ring is grasped by about 75% of infants at the age of 6 months, according to Gesell. At 0;8 the twin R did not reach for the ring until the 13th day of presentation, and D not until the 16th. On the first reaching, however, R did succeed in grasping the ring and bringing it to her mouth, and the same thing was true of D. Mr. Dennis himself, however, calls attention to the speedy 'establishment of reaching' when once it was attempted. As regards sitting alone, this also required considerable practice, but here again the author records that 'retardation was only transitory and the twins soon sat as well as any child'.¹

As to standing with support, other investigators have found that all children stand with support at 12 months and some 90% at 9 months. The twins were tested at 12 months for several successive days, but neither infant supported her weight for even the fraction of a second on the first day. Many trials were given on these first four days, and by the close of the 4th day each infant had stood continuously for two minutes or longer. Surely this is remarkably quick in view of the fact that some muscles concerned would necessarily be very weak through lack of exercise.

Finally, the author reports that both little girls learnt to walk alone satisfactorily; Ray at 17 months, a date not far from the average, Del somewhat later, but still as early as many who are taught and encouraged to walk, and that over a period of many weeks.

The experiment seems to show that when the children did get an opportunity they learnt far more quickly than was usual, in spite of the fact that the deprivations were so drastic and so prolonged that one might have feared a permanent injury to the mechanisms concerned.

Of course the experiment also shows that for these particular skills, mere maturing is not enough: it seems to show that James's surmise was rather too drastic. The amount of practice needed will no doubt vary with the particular activity concerned. For some, mere maturing may be adequate; as we shall see, this seems true of some impulses. For others, mere maturing is of little value. For example, no degree of maturation without any learning could conceivably result in, say, the speaking of a language. The

¹ Op. cit., p. 25.

point to realize is that each activity seems to require a certain degree of maturity.¹ There seems to be an optimal period for learning: practice during that period brings the richest rewards per unit of practice. Earlier practice may hasten somewhat the earlier stages of the new skill, but is wasteful of time and, in some activities at least, results in no permanent gain. It may indeed result in the fixation for a time of less efficient ways—witness the early trained twin who continued to crawl up the stairs while her untrained sister at the same age walked up. I have sometimes wondered whether the habit of some people of using their fingers in simple computation may not be due to prolonged habit in infancy, when they were not sufficiently mature to do, without this concrete aid, the reckoning thrust upon them.

It is evident that there is a great field open for exploration on this question of maturation: but we have enough evidence to raise a doubt as to whether much effort is not wasted in trying to hurry the early steps of reading and number work in average or dull children. The fact that a child can read a few simple words by the age of 5; 0 after six months' careful coaching, without which he could have read nothing, does not mean that he will because of that be six months further on in his reading at 8 years than he would have been without the early start. He may be no further on. One of my research students found that in the three schools he tested, children who entered the Infant school at 4 instead of 5 were, at the age of 11 or 12, no better than the 5 years entrants at learning by heart and actually worse at arithmetic. In handcraft, however, the earlier entrants were superior.² These results are understandable if we assume that the four-year-old children were mature enough to profit from handcraft instruction, but not from teaching in arithmetic.

These observations on the importance of maturation also show how absurd it is to assume that because a certain impulse has not appeared by, say, one year, therefore if it appears at 2 years it must have been learned through experience, as J. B. Watson assumes about the appearance of fears—a point with which I shall deal in a later chapter.

¹ Yet even in learning to speak greater maturation may to some extent make up for lack of earlier training or practice: thus Wolfert reports on a girl who at 2; 6 could only speak one word, through earlier neglect; yet after a change of environment she was up to the average for her age in less than three months. (Quoted by C. and W. Stern, *Die Kindersprache*, p. 296 (Leipzig, 1928, vierte Auflage).) Further relevant examples will be met in our later chapter on Language.

² See article by E. M. Rhodes in *The Forum of Education*, Vol. 4, 1926. The inquiry was based upon that of Winch, reported in his book *When should a Child Begin School?*

In reference to the development of disposition or temperament also, it seems advisable to keep in mind the possible results of mere maturation. The appearance of new capacity for self-control of a child of 8 or 9, compared with his behaviour at 7, may not entirely be due to his treatment in a new school or in a clinic. The more rapid the change, the stronger the presumption perhaps that it is due to environmental influences: but even a very rapid change is no proof that maturation is not one and even the main factor.

Maturation and exercise. It is of course also important to bear in mind the other aspects of the maturation problem, namely, that for many activities and skills delayed exercise may prove too late. I have referred to the popular idea that practice in speaking a foreign language may be begun too late to secure accurate pronunciation. I noticed in more than one of my children that the French nasal sounds were imitated with extraordinary facility at about the age of 3; 0, and that this ability was subsequently lost, to a very considerable extent, by about the age of 7 or 8, and probably before. We have not, I think, enough evidence to assert dogmatically, as Montessori does, that if the child is starved of practice in manipulation at one particular period, it suffers for it through life. Montessori says they 'found' this, but gives little systematic evidence. On the other hand, the evidence seems sufficient to justify us in trying to provide children with the opportunity of practising and exercising their various capabilities as they develop, and especially when the children themselves seem to show a strong impulse to use them.

As we shall see in the chapter on Play, the healthy infant is largely occupied during the first year or two in vigorously practising each new function as it appears—hand movements, sound-making, and so forth. Here, then, is spontaneous self-training, though the infant can be helped by the provision of objects for manipulation and encouraged by the interest and co-operation of a parent. It is when there is trouble in forcing or elaborately encouraging little children to exercise a merely dawning facility that the effort becomes of doubtful value, as, for example, when regular lessons in reading only result in a child learning to recognize a few words after some weeks' work.

This conclusion may seem to be very indefinite. The plain fact is that here, as often in infant psychology, our knowledge is very uncertain and no good can come of asserting dogmatically rules of procedure which have no scientific basis.

Physiological conditions and mental development. On this question of the exercising of a capacity at the most profitable time we cannot ignore the relevance of the conditions of physical hygiene,

in particular the proper nourishment of a child. Broadly speaking, we know that the lack of proper nourishment at certain very early periods may result in specific bodily weaknesses, for example, rickets. It may be that lack of appropriate nourishment may affect also the maturing and the capacity for exercise of specific functions which cannot be evolved when once a certain period is past. We must look to the physiologist for fuller information on topics allied to this. At present the evidence has not approached sufficiently close to our main psychological problem, but there are a number of findings that are suggestive, though the most striking are chiefly limited to the study of animals. The restriction of diet of young rats, for example, for about twenty days, has been found to delay the onset of puberty for about twenty days, and the earlier the restriction the greater the retardation.¹ Puberty may even be prevented from ever developing. The evidence for the stimulation of myelination of nerve fibres (i.e. the growth of the sheath round the nerve) as the result of exercise after birth seems to promise useful evidence as to how far stimulation or exercise at this stage would hurry maturation, though one of the latest authorities, K. S. Lashley, maintains that we are still ignorant as to how far myelination of nerve fibres is important in their functioning.² Lashley goes on to say that 'there is little evidence that the development of nerve cells is stimulated by functional activity'.³

Fundamental and higher functions. It will be generally agreed that the relative importance of maturation and of practice or learning varies with the type of activity and with the stage of development considered. On general biological grounds we may expect that the fundamental and essential functions will be secured by maturation without the need for training or for stimulation other than that provided by the normal environment. Thus reflexes develop to perfection by mere maturation without any practice, and the fundamental instinctive tendencies also seem to ripen in readiness for their appropriate stimuli; any 'improvement' is largely in the mode of securing their ends, in which intelligence co-operates.

In other so-called 'higher functions' and in skills which are remote from innate activities, practice and learning seem more important: though here, too, a certain degree of maturation is

¹ See chapter by Calvin P. Stone in the *Handbook of General Experimental Psychology*, p. 372 (Clark Univ. Press, 1934).

² See article on 'Nervous Mechanisms in Learning', by K. S. Lashley in *Handbook of General Experimental Psychology*, p. 460. It seems, however, to be generally thought that the time of myelination of a given tract coincides with the time that it begins to function.

³ See article on 'Nervous Mechanisms in Learning', by K. S. Lashley in *Handbook of General Experimental Psychology*, p. 462.

essential for any appreciable learning by training : and the maturation at times is astonishingly specific. Thus my boy B was able to understand and use the number 'two' at the age of about 2 ; 0 to 2 ; 3 ; but though I was constantly coaching and testing him he could not use the number 'three' until about nine or ten months later, as was shown by his response in practical tests. Preyer's son, after using two words together, was a year older before he used three words together. Thus, though it is, broadly speaking, true that maturation is relatively most important in the earliest months, we cannot assume that the late appearance of a function proves that it is due to experience. The ripening of certain sex functions and interests at adolescence seems a clear warning against this fallacy, and mental testers are familiar with the futility of trying to train young children to perform certain tests which statistics show can only be accomplished by children some years older. And even when careful training of a function does apparently result in some advancement of the time of perfection, that is no proof that perfection would not have been reached by mere maturation, though at a somewhat later date.

Subsidiary evidence for the fact that early development is largely dominated by the maturing of predetermined organizations or 'patterns' is found in the regularity of the order of development of many varied functions and capacities, in spite of very varied environments. Thus Mary Shirley in her careful study of twenty-five babies found that in the development of many varied activities the sequence within each activity is not altered by the speed at which development proceeds, and that 'individual differences are never strong enough to alter the developmental course'.¹ This was found true of 'reactions that decline and disappear with age'—as well as for those which improve and remain. It must be borne in mind that Miss Shirley was studying only elementary and chiefly fundamental processes occurring in the first two years : and that this regular sequence refers to the important stages within each of these main types of activities. It leaves room for considerable individual differences in highly specific abilities, especially on a higher level. Furthermore, though the sequence within each series (say motor development) is remarkably regular, the parallel development between different types of activities—say motor and speech—is not so great. In some exceptional cases even the most fundamental functions may appear out of season ; for example, the onset of puberty in a girl at 3 ; 6—though she was otherwise normal up to the latest time of observation at 17 ; 0.²

It is tempting to suggest that one test as to whether a trait x is

¹ *The First Two Years*, Vol. III, pp. 48-9.

² Reported by A. Gesell, in *Biographies of Child Development*, p. 76.

due to maturation rather than to experience may be, 'Does x appear in the majority of cases at the same age?', and still better, 'Does x appear at the same place in a regular sequence of developments, even if its actual age varies with the individual?' Stated thus, however, it would not invariably exclude all developments largely due to learning.

The regularity of the *order* of appearance of many varied functions is certainly remarkable, and especially when it is shown by prematurely born infants. The violent change of environment, the new stimuli raining in on the senses, the change of nutrition, the new possibilities of exercise of some functions must surely have a great effect when it occurs at an immature stage. Yet with variations within a range of three months or more round the normal birth period, Arnold Gesell has repeatedly found the order of development—what he calls 'the pattern of genetic sequence'—remains practically unchanged.¹

Maturation and physiological conditions. Of course, all that has been said of the scheme and progress of maturation and its relative independence of environment or exercise is consistent with the possibility of its being profoundly affected, as already suggested, by feeding and other physiological influences. The metamorphosis of tadpole into frog, for example, can be greatly hastened by feeding it on thyroid gland.² Rate and pattern of maturation are also affected by internal physiological factors.³ Abnormalities in the rate of development in human beings, as in precocious puberty or in the arrested development of certain types of mental deficiency, are caused by various innate physiological peculiarities, e.g. 'the premature release of growth-promoting hormones' or their delayed release or deficiency.

"It is possible for there to be a competition between the genes which control any particular character and those which determine the assumption of the adult stage, and unless the former work fast enough and get in in time, the character will not be able to show itself. This is what actually happens in those cases in which an animal becomes sexually mature while still in the young stage, a phenomenon known as neoteny or paedogenesis."⁴ "On the other hand, by delaying the time at which the adult state is normally reached, it is possible to cause structures to appear which would not ordinarily have done so. So in the case of the female gypsy moth, Goldschmidt was able to delay the onset of maturity sufficiently long for the male-producing genes to overtake the female-producing ones

¹ See his article on 'Maturation and the Patterning of Behaviour' in *Handbook of Child Psychology*, p. 217.

² See C. P. Stone, *Handbook of Experimental Psych.*, p. 371.

³ *Ibid.*, p. 372.

⁴ *Embryology and Evolution*, by G. R. Beer, p. 26 (Oxford, 1930).

and so bring about the formation of male structures in an otherwise normal female.”¹

How far malnutrition in early years may permanently affect the possibility of normal maturation is a profoundly important question; it is a question the answer to which probably cannot be fully given until we know much more of the details of early development of normal and well-fed children. For small elementary functions may be modified even if broad lines of development are not affected. Gesell gives some striking examples of physical diseases in infancy without any marked effect on mental development. Among 258 children of 1; 0, 1; 6 and 2; 0, Gesell concludes that there was only a very slight inferiority in mental development among the rachitic children.² The figures he quotes do indicate a clear inferiority in various tests of walking, but this inferiority is much less at 2; 0 than at 1; 0. In the prematurely born infant Gesell points out ‘the substance of the brain undergoes normal increase even when the rest of the body grows slowly’; there is ‘a preferential growth of the nervous system’ here as elsewhere.³ In the same book he gives examples of serious illnesses which had little effect on the steadiness of mental development.

If we consider the question very broadly, we find that in children of, say, 7 to 14 there is a positive but not a high correlation between physical and mental development. Thus Burt found a correlation of 0.44 between height and mental age for boys of the same age group, and no more than 0.37 between weight and mental age.⁴ Also various factors may enter in to effect such correlations besides the actual nourishment of the child concerned. There is the possible influence of heredity on the smaller stature of the poorest ranks. In his summary of the relation between physical and mental aspects of retardation Burt puts, as the first cause of both, the ‘innate or inherited lack of vitality—a weak developmental impulse’; and after putting as a second cause ‘disease or malnutrition during the first year or two of life, including the prenatal period’—he adds that ‘it is not easy to distinguish between this group and the former’.⁵

In any case, as Burt’s figures show, the general correlation of size and physical health with mental development is imperfect.

¹ *Embryology and Evolution*, by G. R. Beer, p. 27 (Oxford, 1930). That marked sexual precocity may be accompanied by *normal* development in intelligence, personality and interests is shown by the remarkable example given by Gesell of the girl in whom menstruation began at 3; 6. See *Biographies of Child Development*, p. 76.

² *Infancy and Human Growth*, p. 268.

³ Op. cit., p. 323.

⁴ See *The Backward Child*, p. 137.

⁵ Op. cit., p. 160.

The correspondence is certainly subject to many and striking exceptions and irregularities. Thus Dr. Shepherd Dawson in an extensive inquiry in Glasgow found that some forms of acute and chronic general disease, even when they caused long periods of invalidism and absence from school, had little if any effect on intelligence. On the whole, it was only if the disease was in the ductless glands or brain that intelligence was appreciably affected.¹

In summing up this section it seems clear that our knowledge of the exact specific physical influences on mental traits and development is still hazy. There seems to be no satisfactory evidence that malnutrition in infancy need have any permanent ill effect on *innate* intelligence as is sometimes thought, though malnutrition or any ill-health may, of course, interfere with the *acquisition* of knowledge. The known specific effects of certain physical defects are, however, suggestive, as, for example, thyroid deficiency and cretinism. Equally suggestive are the specific mental effects, in later childhood or adult life, of some physical conditions, for example, the optimism of tubercular patients and the association of chorea with emotional instability. A former distinguished medical colleague in my University used to assert that serious rickets was always followed by moral weakness, but he seems to have relied chiefly on general impressions. It seems that the study of cause and effect must be made with more specific physical conditions and more elementary or specific mental factors, especially in the earliest years; and here again we have a justification for the detailed and highly analysed study of mental development in the first year or two of life.

Along the lines of such study of mental development indeed seems the most hopeful, or at least one hopeful, approach to the discovery even of the presence of physiological factors affecting development. It is significant that we find one like Dr. Gesell, who emphasizes the basic physiological conditions for mental growth, acting as a pioneer in the discovery of tests of mental development during the first months of life.²

¹ See *Intelligence and Disease*, Medical Research Council Special Report Series, No. 162, 1931, p. 51.

² Consider especially Dr. Gesell's important concept of 'intrinsic insurance factors' which tend to make up for deficiencies in the growth of child. These, he says, are not a single generalized capacity but 'specific biochemical and somatic structures'. But though the concept is 'derived from experimental embryology and from clinical observation', our only clue to their presence in early months is the vague and uncertain one of 'vitality'. *Biographies of Child Development*, pp. 106, 107.

CHAPTER IV

Further Aspects of Mental Development

The intermittent nature of development. It must not be supposed that development in these early years is one steady continuous progression. Apart from the alternations of advances and periods of rest (familiar in experiments on learning or acquirement of skill as rises of the curve of progress followed by plateaux), development appears to be intermittent in the sense that a function will appear once or twice as though mature and ready for practice and then will disappear for days or weeks before its next appearance.

This phenomenon appeared in my children most markedly in developments somewhat later than the first few months—especially in speech and the beginnings of thought processes. For example, a question by a child under 3;0 would reveal a first flash of the idea of physical causation: and then months go by without the idea appearing again.¹ But it also appeared clearly in physical skills; and other careful observers have noticed it in various functions. Many examples from my own observations will be given under chapters on particular topics, but I may give a few examples here and quote some notes of other observers supporting the statement.

Holding up the head steadily is an accomplishment that is only fully developed by the age of about 6 months on the average. But it appears momentarily almost from birth. So, as we shall see later, the first momentary success in grasping may be followed by an interval in which the capacity seems to be lost. Miss Shinn noted the repeated bringing of a pencil to the mouth by her niece at 7 weeks, but it seemed to be an isolated occurrence; the serious process of learning to put pencil to mouth only began several weeks later.²

In repeated testing of infants it has been found that there may be days and even weeks between the first and the second reaction of the same kind in some tests. For example, at 1;6 even the development of certain reflexes appears to be intermittent, as will appear in Chapter VIII. But the phenomenon appears most clearly in the higher mental processes. Its characteristic quality is that the function appears once or twice, with a long interval before the next appearance. Then it appears again, followed by a shorter interval:

¹ It is interesting to speculate whether such intermittent flashes of understanding are more characteristic of children with high intelligence quotients.

² See Shinn, *Notes on the Development of a Child*, Part II, p. 86 (Univ. of California, 1907).

then again—with still shorter intervals until fully established. (Extreme regularity is never actually found, but it is sufficiently clear to distinguish it from the next phenomenon we shall discuss.)

This intermittence is shown also by interests or favourite activities of given short periods. Thus Miss Shinn observed that at 0;5 her niece's chief interest was in her own vocalizing: but this lapsed from 0;5 to 0;6 and then revived again and was prominent from 0;6 to 0;7.¹

The sudden flaring up of a special interest which dominates for a short time and then disappears, or almost disappears, is a different phenomenon, dependent apparently on some newly acquired capacity or some new apprehension. Thus at 1;3 D. R. Major's child showed an interest in hats almost amounting to a mania, 'overshadowing every other interest in this month'.² 'He wanted every hat he saw, no matter where or to whom it belonged. When given a hat, he would busy himself by the hour crushing in the crown and straightening it out by putting the hat on his head and pulling down.' This sudden appearance and temporary concentration upon some new game is typical of much we shall study under Play.

The intermittence in development is made more marked by the lapse of new attainments under fatigue or illness. Indeed, at those times there may be the temporary loss of a fairly well established accomplishment, a regression to an earlier form.

In these intermittent developments we seem to have mental parallels to the genetic physiologist's concepts of 'regression' and 'a period of latency', as principles of the development of neural structures.³

Anticipatory developments. The phenomena of anticipatory developments differ from those exemplifying intermittent development in that the early form differs much more from the later, which does not gradually grow out of the former. When one of my boys was only 2 days old I was astonished to find that when held so that his feet just touched the ground he performed 'regular walking movements, progressive, forward movements, not mere pressure against the floor on lifting legs up and down'. (I quote the note I made that day.) The phenomenon was so strange to me then that I made a special point of testing another child and noted that he too did the same slightly on d. 3 and very definitely on d. 11.⁴ With the one girl tested it also appeared, but disappeared

¹ See *Notes on the Development of a Child*, p. 129.

² See *First Steps in Mental Growth*, p. 244 (New York, 1906).

³ E. Dewey, *Behaviour Development in Infants*, p. 149 (Columbia Univ. Press, 1935). Miss Dewey refers to 'regression, or a period of latency' as 'an accepted principle in the development of neural structures'.

⁴ The letter 'd.' is used here for 'day' and so throughout this book.

by d. 14. With a third boy it disappeared by d. 20, with the first-mentioned child not before the end of the month. (More details will be given in the chapter on Reflexes.¹) Observations made recently on 125 infants showed this stepping reflex to be present in the majority of the infants.²

This reflex seems to disappear completely before the time when voluntary attempts to walk take place. A similar but not so marked evanescence seems to mark another reflex—the jerking up of the arms when startled, which occurs in the earliest weeks but is much less marked later on, though it appears occasionally in adults.

A clearer example may be the carrying of the thumb to the mouth in the first few days, a feat which is performed with more deliberation and effort in later months: though here it is hard to be certain that the early successes are not chance occurrences.

Physiologists have recently reported that crude reflexes may occur in the foetus and reappear later after birth in a more co-ordinated form.³

These facts about the stepping and other reflexes suggest that Koffka's explanation of such anticipations as the carrying of the hand to the mouth is quite inadequate. He thinks them due to 'Objective conditions' being 'unusually favourable'—and 'since these conditions do not repeat themselves, the configuration can only reappear when a change in the internal condition has taken place'.⁴

Temporary favourable conditions are surely not sufficient to explain the appearance for a week or two of the stepping reflex and then its complete disappearance or great deterioration for some months in spite of the healthy growth of the child and repeated efforts by the parent to reproduce the phenomenon. It looks much more like an early ripening of a more primitive form of activity—which in some cases may finally co-operate with a later stage (as we shall see happens when the grasping reflex gives way to the voluntary grasping), or in some cases (as in the stepping reflex) disappears more or less completely.

With some functions, however, it does seem that specially favourable conditions—both objective and subjective—assist in the first efficient working. In the development of thinking, as we shall see, some specially interesting situation seems to stimulate activity and raise it momentarily to a higher level, not revealed

¹ An account of these observations was published in my article on Reflexes in the *British Jour. of Medical Psych.*, Vol. VII, 1927.

² See L. B. Chaney and M. B. McGraw in the *Bulletin of the Neurological Inst.*, New York, Vol. 11, 1931.

³ See the references to some of Professor Barcroft's work given in the next chapter, p. 62.

⁴ See K. Koffka, *The Growth of the Mind*, p. 263 (translated by R. M. Ogden, London, 1924).

again for some time. But in the case of the stepping reflex—and indeed of the earliest appearances of some other reflexes, as we shall see, the objective or external condition may be repeated in their most favourable form and yet fail to produce the result.

This curious phenomenon of the early appearance in a crude form of an activity which disappears, and then reappears after a considerable interval in a fuller form, may explain the appearance of slight early sex-development in boy infants (e.g. erections in the first weeks or months) and their disappearance later, the latter being attributed by some Freudians to repression. We shall examine this question more fully in the chapter on sex-development.

Precocity and retardation. Precocity is something quite different from the curious phenomenon we have just discussed, 'anticipation'. By 'anticipation' we mean the temporary appearance of an activity at a date earlier than that which marks its permanent acquisition by the same individual. By 'precocity' we mean the regular appearance of an activity at a date earlier than that at which it generally appears in other individuals, i.e. earlier than the average age.¹

The main facts as to general precocity of some children and the slow development of others are fairly well known. They are discussed in various recent books and we need not deal with them here.² The aspect of the subject on which the detailed and analytic study of infancy may eventually contribute valuable evidence is that of precocity or retardation in specific abilities or traits—apart from general precocity.

Testers of general intelligence are interested, of course, in general precocity, normality or retardation. The frequency of various degrees of precocity as judged by such tests is fairly well known at least after about 3 years of age.

Here I want simply to call attention again to that development of specific abilities which seems to be taking place even in the first year or two, and apparently independently to some extent of the rate of general development. In Chapter I reference was made to precocity in linguistic development combined with some retardation in drawing ability, even as early as 3 years of age. The graph of linguistic development of the three children given there (p. 13) suggests that the specific abilities involved in language may begin to show their respective rates of growth even as early as the first or second month. We shall come across many other

¹ By 'age' we understand usually chronological age, but we may refer to *mental age*: for there may be precocity or retardation in the case of a specific ability when that ability appears at a stage earlier or later than one would infer from the child's general mental development.

² The reader may be referred to the following: Professor Burt's *The Backward Child*, an excellent and comprehensive survey; and Professor Terman's *Genetic Studies of Genius*, an extensive study in three volumes.

examples of the varying rates of development of specific abilities in different individuals in later chapters. The time of differentiation of these is still obscure, whether it be their differentiation from one another, or from any more general abilities or activities. As we shall see shortly, elementary reflexes seem at first to involve a general mass-activity of the whole organism. Similarly the whole organism of the baby of one or two months seems to join in the expression of any feeling or emotion. Only later are specialized forms of expression for particular feelings completely separated. The very relation between general and specific abilities may be different in the first year or two of life. Mental development may be like the opening of a flower-bud, in which at first to the average eye all seems roughly homogeneous; but gradually individual parts separate out and eventually become highly differentiated. Or it may be, even more, like the original cell which develops into a human being, in which even by the microscope relatively few parts are distinguished at first.

There is a notable conclusion drawn by a distinguished anatomist as to relation between the development of behaviour and of structure in the lower animals. 'Behaviour', he writes, 'develops from the beginning through the progressive expansion of a perfectly integrated total pattern and the individuation within it of partial patterns, which acquire various degrees of discreteness.'¹ It is possible, and indeed seems probable, that mental development in infancy follows similar lines. In this gradual differentiation, the connexion of the germ of special abilities with a general one may at first be more intimate. It may draw out the general fund of energy more completely. Adopting for the moment, without approving, Spearman's view of a general energy combined with specific 'engines', it might be said that with the engines as yet incompletely formed, performance depends more upon the general energy than on the specific machinery. (This is all speculation—but there is no harm in that provided we recognize it is merely speculation.)

If this were true, then all early tests should be tests of general ability to a greater extent than they are at later stages, and it is a notable thing that general liveliness and alertness of mind in the first year seems to be as closely associated with later general intelligence as are more specific tests; and so are some activities at 6 or 12 months which *prima facie* seem only remotely connected with intelligence.²

¹ G. E. Coghill, quoted by A. Gesell and Helen Thompson in *Infant Behaviour: Its Genesis and Growth*, p. 298 (New York, 1934).

² Of children of school age it still seems true, as Burt wrote, that the relative influence of the more general capacity is greater in earlier years than it is later. See his *Mental and Scholastic Tests*, p. 266.

Yet against this is the fact that two infants in whom average development may be much the same, may reveal marked differences in specific tests in the first and second year. As already mentioned, one of my own children and several others whom I have tested, would at about 1;6 accomplish easily some of the tests normally done only at 2;0 and yet fail badly in others done by most children at 1;6.

At these very early stages we are met by a further complication which may affect many of a child's performances in different types of activities and result also in great individual differences among several children in specific activities, even when the general average of performance is about the same; I refer to the fact that one type of ability seems to push ahead for a time and then to take a rest while others have their turn. In one child capacity (*a*) will advance before (*b*), in another child (*b*) will precede (*a*). These alternations of development we may now consider.

Alternations of specific developments. My own general impression, recorded from time to time in notes under specific topics, was that there were alternating periods in which first one kind of capacity would develop while others marked time, and then another kind would come to the fore. Several other observers have noted the same. Miss M. Shirley in her study of twenty-five infants under 2;0 remarked a frequent lull in progress in creeping: and here there were clear individual differences at a given period. Thus 'In one baby locomotion development proceeds rapidly at the expense of language and manipulatory development: in another the situation is reversed.'¹ 'While the reaching act was being perfected, their vocal play was very much diminished. It reappeared just after reaching was well established and was again discontinued while the baby was perfecting his skill at sitting.'²

More recently Dr. A. Gesell on the basis of repeated testing of children in the first two or three years in five aspects of development (postural, perceptual, adaptive, language, and social) has concluded that these components cannot 'mature in lock step along an unbroken front. At any given moment the margin of advance is an irregular rather than a smooth line'. Furthermore, 'the margin shows fluctuations, possibly rhythmic in character'.³

It may be suggested that the mere diversion of interest for a period from one activity to another and especially a new one—would account for these alternations in advance: and that does seem an important aspect after the first two years or so.

But what causes such change of interest and attention when

¹ M. Shirley, *The First Two Years*, Vol. II, p. 462 (Minneapolis, 1933).

² *The First Two Years*, Vol. I, p. 132.

³ *Biographies of Child Development*, p. 9 (London, 1939).

there is no change of environment? Partly, no doubt, the lessening of interest in the familiar: but so far as a new ability suddenly absorbs attention that seems to be largely a question of maturation (of growth due primarily to internal factors), which thus again seems to be the main influence at work.

It is possible that some of the periods of apparently general marking time which several careful observers have noted were really periods of *transferred* activity. If one is watching especially activities (a) and (b) and the curve of progress seems to reach a plateau, it may be that some alternative activity for which the observer is not on the look-out is taking place unobserved. On the other hand, some most dependable child psychologists confirm my own observation that development seems to have periods of general rest and then rapid advance, comparable to the plateaux and rises of an experimental learning curve. These periods may be a day or so, or later on a week or several weeks. Sometimes, at least, they cannot be attributed to any apparent physical causes. Mrs. Moore speaks of 'seasons of noticeable acceleration and intervals of extraordinary slowness'.¹ She describes 'a day of awakening' (on d. 35), of exceptional alertness, as ushering in one of these 'seasons of rapid development'. Some of her records of later periods of special activity refer especially to specific developments, e.g. learning to walk and vocabulary increase.

Concerning specific abilities there seems certainly no doubt that there may be an alternation of advance and stagnation. It is more exactly measurable in higher functions such as speech. Clara and Wilhelm Stern, whose book *Die Kindersprache* (based on the detailed study of their own three children) is a classic, remark that in the progress of speech, periods of stagnation, sometimes a source of anxiety to parents, are suddenly replaced by periods of rapid progress, to be again followed in their turn by very slow development. Indeed, a period of stagnation in *active* speech usually coincides with a period of marked increase in *understanding* of speech.²

The fact that such fluctuations occur most markedly in specific abilities is indeed strong evidence that they are not due to variations in general physical condition, which we should expect would affect all or most activities at the same time.

¹ *The Mental Development of a Child*, Psych. Review Monograph Supplement, Oct. 1896.

² *Die Kindersprache*, p. 178 (Vierte Auflage, Leipzig, 1928.)

CHAPTER V

Endowment and Behaviour of the New-born Infant

The neonate. The terms 'new-born infant' and 'the neonate' are somewhat vague ones. Professor Arnold Gesell uses 'neonate' as referring primarily to the first month, but covering in a general way the first three months.¹ On the other hand, Miss Evelyn Dewey, in her extensive survey of the literature, physiological and psychological, of the neonatal period, says that this is usually taken to cover the interval from birth until the umbilicus is healed—about two weeks. The most careful studies, she says, indicate that, while 'behaviour growth is taking place in these first weeks, the changes are slight' and that 'no emergence, marked development or regression of patterns takes place'.² This statement is certainly not true according to my own observations.

Individual infants seem to vary in this respect; and, as we shall see, some decided progress may take place even in two weeks—partly, no doubt, because the mere raining of many new impressions upon the senses, the suddenly increased supply of oxygen and other changes have a stimulating effect on the nervous system of the child, and partly, perhaps largely, because of mere maturing.³

The appearance of activities in these first days is, of course, valuable positive evidence as to their innateness, though the absence of certain activities in the first weeks or even months is no conclusive evidence against their innateness; for as we saw in the third chapter, the need for maturing must always be borne in mind.

It will be convenient to give a general report on the first few weeks of an infant's life before taking up the lines of special development in detail. We should first remark that any general statements here are not to be taken as holding for prematurely born infants, though there is evidence that an infant born, say, a month before its proper time, matures more rapidly in the new environment than he would have done if he had remained in the womb the full term: ⁴ but he tends to be somewhat behind the normal child of the same age reckoned from birth.

¹ See *The Mental Growth of the Pre-School Child*, p. 196 (New York, 1925).

² *Behaviour Development in Infants*, p. 67 (Columbia Univ. Press, 1935).

³ I am informed that some recent and, as yet, unpublished work done in the Physiology Department at Cambridge, emphasizes the importance of increased oxygenation as a stimulus in the development of new-born rats.

⁴ See paper by H. Bersot, quoted by E. Dewey, *op. cit.*, p. 63.

For a complete genetic history of the child one should really start with development before birth, and indeed considerable attempts have been made to estimate the various capacities of the foetus at different ages before birth. Of course there is an extensive body of knowledge as to the anatomical and physiological development of the foetus, but as to the psychic life of the child before birth there is little but surmise. We know that he can move vigorously some five months before birth; the vigorous child B some four months before birth upset a cup of tea his mother was holding against herself. In a foetus of a few months old there is apparently spontaneous movement before there is response to external stimuli, but tests show that some reflexes have also developed long before birth.¹

The facts as to the foetal capacities are the most striking illustration of a general principle of development—that nature must begin the preparation of capacities long before they are biologically needed.

There are certain actions or reactions of the new-born infants as to which there is general agreement among medical and psychological observers and which we need here only mention, namely, crying and the reflexes sucking, yawning, sneezing; stretching and other spontaneous movements of the whole body in the form of wriggles and especially constant movements of the lips and head. When we come to the functions of the special senses and the occurrence of some other reflexes, evidence is slighter and less unanimous. No one has studied the first movements and sensory reactions and their immediate developments more thoroughly than Miss M. W. Shinn, and I may say at once that my own observations on these early days confirm two of her most decided general conclusions based on the infant she studied:

- (i) that 'the mouth is at first the chief organ of touch and prehension': and
 - (ii) the psychic life of the child centres from the first about the higher centres (especially sight), not the lower²
- though here I should be disposed to add 'at least after the first few days, during which general bodily conditions and the satis-

¹ The evidence as to pre-natal behaviour is well summarized in Evelyn Dewey's book referred to, Part II. See also L. Carmichael on 'Origin and Pre-natal Growth of Behaviour', *Handbook of Child Psychology*. As regards foetal life itself, Professor Barcroft has shown that on the 92nd day of the foetal life of the sheep, it is possible to elicit most of the reflexes of which the lamb is capable; and that it is actually easier to elicit them then than it is considerably later—namely, the 138th day of foetal life. (See 'Foetal Respiration', The Croonian Lecture in *Proc. of Royal Society*, 1935, p. 261.)

² See her *Notes on The Development of a Child*, Vol. II, *The Development of the Senses*, pp. 13 and 14 (Univ. of California Publications in Education, 1907).

faction of hunger seem to be the main factors affecting the psychic life of the child'.

There is less agreement among observers as to eye movements and adjustments and as to the blinking reflex in the first few days and weeks. (Possibly these differences are largely due to innate individual differences among the infants.) But there is no doubt as to the extraordinary rapidity with which the *vision* begins to function efficiently, and the infant begins to gaze intently at human faces and other objects. This will further be illustrated by notes from my diaries.

As to *taste*, one observer found that some discrimination between sweet on the one hand and sour or salt or bitter was present in some infants in the first two weeks, the latter causing a turning away of the head; but another questions the capacity for this discrimination if the taste solutions are of equal strength. Recent work also throws doubt on the views of some earlier observers that the sense of *smell* is already developed at birth.¹

As to *pain*, however, there is more agreement that, in the first few days of life at least, the infant is far less sensitive to pain stimuli than he is later: sensitivity to the touch of cold objects being greater than to painful stimuli. Pain will be dealt with more fully later in this chapter.

As to *hearing*, there are physiological grounds for thinking that at least for the first few hours hearing must be impossible.² Evidence is not uniform as to all infants for the period of the first fortnight. Miss Shirley, for example, reports that 7 out of 24 babies tested in the first two weeks did not react to sounds.³ On the other hand, in an experiment by Dorothy K. Marquis on eight infants, a buzzer was sounded near them each time they were fed, from the first feed to the tenth day; and by the end of a week some of them showed anticipatory signs of feeding when the buzzer sounded.⁴ Some responses to loud sounds in the first day or two may, however, be signs of sensitivity to vibration without actual hearing. Even a foetus, one month before birth, has been found to make responses by sudden movements to loud sounds outside the body of the mother.⁵ In Miss Marquis's experiment it is uncertain whether any vibration could be felt by the infants.

¹ As to taste and smell, see S. Bernfeld, *The Psychology of the Infant*, pp. 37 ff. (London, 1924), and E. Dewey, *op. cit.*, pp. 80-6.

² See Bernfeld, *op. cit.*, p. 40. Also Dewey, *op. cit.*, pp. 88-92.

³ E. Dewey, *op. cit.*, p. 89.

⁴ See 'Can Conditioned Responses be Established in the New-born Infant?' *Jour. of Genetic Psych.*, Vol. 39, Dec. 1931, p. 479.

⁵ H. S. Forbes and H. B. Forbes on Foetal Sense Reaction: Hearing, *Jour. of Comp. Psych.*, Vol. 7, 1927. The authors thought the responses to be true auditory muscular reflexes, but admit that they were possibly tactile.

Having indicated some of the unsettled questions as to the capacity of new-born infants, I now quote some of my diary observations for the first fortnight on the boy B, of whom I took fullest notes. B was a very healthy infant, 10 lb. at birth, born about a week after the date at which he was expected.

A diary of the first fortnight.

(Day is indicated by d, the mother by M.)

d. 1. Born 3 a.m. Cried lustily a few minutes later. Sneezed about half an hour afterwards. 4.30 a.m. Took the nipple vigorously when placed well in the mouth. Squint observed: generally right eye open only. Yawned frequently. 10 a.m. Co-ordination of eyes seems perfect: but left eye held open alone sometimes. Sometimes there is exact co-ordination of movement of head and eyes—to and fro. Sucked his right thumb, even though he would not seriously tackle the nipple (possibly because position inconvenient); this occurred just after he had had the nipple put into his mouth. His nurse says that he will suck her finger if it is turned upwards in the mouth; but he rejected my little finger from his mouth (was it too cold?). Grasped my little finger with left hand, but not very strongly. Eyes seem sensitive to light, closing more often when light from window falls on them than when shielded. 5 p.m. Lusty crying quietened by swing motion, or was it merely changing of pressure? Toes close occasionally on my finger: they are very active, closing and opening spontaneously. No sign of following bright objects with eyes. Nurse and M report several responses to sounds, e.g. starting at coal-box sound when at the breast, opening eyes and restless movement (when sleeping) at noise of passing trains; also crying at shriek of train passing. (But I was not able to check these observations myself.) Only right hand sucked so far.

d. 2. 11 a.m. Tickling of mouth at one side causes raising of upper lip wide on same side. 5 p.m. Appears to follow my hand moving to and fro 3 inches off his head. Has slept most of the day. His indifference to the breast has led to the nurse giving him sweetened milk with a spoon to-day. (A medical friend tells me that this practice is begun by some nurses because of the late arrival of milk in the mother's breast. He believes some infants are thus deflected from the breast feeding, when persistence would result in the infant getting milk satisfactorily in a few days.) 7 p.m. When held with his feet just allowed to touch the floor, performs quite regular walking movements, progressive forward movements, not mere pressure against floor or lifting up and down. During night scratched his cheek enough to bring blood.

d. 3. 10 a.m. Showed no sign of alarm or pleasure when piano was played fairly loud (perhaps a displeased expression at high notes). Cried much this morning; mouth active in lapping motion, though nipple held to it. The spoon feeding being withheld, B nursed well about an hour later. When held on knee, preparatory to bath, groped vigorously with hands and arms as though for something to hold. When his father's head

was offered he grasped the hair and tugged vigorously ; his hands had to be unclasped.

Stopped crying twice when watch held near his ear, but not on two other occasions.

d. 4. Appears to follow bright object a little when moved very slowly and not far (3 inches) from his eyes. Head on pillow, drawn back when forehead rubbed, several times.

d. 5. As he was lying crying with eyes closed, I took his 'comforter', moistened the end with a drop of milk and held it near his nose, taking great care he should not touch it or me. He quietened at once, opened eyes wide and made sniffing noises.

There is a strong resistance to passive movement, both in arms and head, so strong that I fear to force it.

I felt convinced this morning that he follows with his eyes a short way a candle light about 18 inches from his face, but he soon gives up. I do not think he follows at all vertically, only in horizontal direction. The following of an object (my hand and a pencil) was also noted in A on d. 7.

For the first time I got a clear case of inhibition of lusty crying by rubbing forehead (noted in A on d. 4). A few minutes later the same failed, but the rubbing of the nose succeeded at once. (The success of the new means of diversion mentioned here, rubbing the nose, when another had ceased to work, is notable.)

B wakes first with slight grunts, and movements of arms ; then come yawns, louder cries and greater movement.

d. 6. Again stopped crying when nose rubbed. Resistance to passive movement very strong.

d. 7. Slept nearly all day. Slept 8 hours on end in the night. There is very little tension about arm muscles during sleep.

d. 9. Walking reflex still present, as decided as before. Loud clapping when B asleep brought no result. Fixation, I think, observed to-day. By this I mean a steady looking at a definite object or lighted surface, probably what Miss Shinn calls 'staring'. Certainly staring began about this period, if not earlier.

Considerably greater control of eye movement ; silver brush followed with eyes, but he soon gives up. Marked facial contortions on slow awakening. 'Worries' round the nipple when not very hungry, almost like a dog with a bone.

Finger-grasp reflex not shown to-day, nor does touching of mouth cause lip movements so much as before. Hands in constant 'jerky' motion, as though both sets of (antagonistic) muscles were normally at tension and then suddenly one set were relaxed, for arms are stiff to resist any movement.

(Compare simultaneous contraction of antagonistic muscles under influence of strychnine which Sherrington suggests obscures reciprocal innervation.¹ In B at this stage brain inhibition may not have developed sufficiently.)

Seems to be tickled unpleasantly by the touching of inside of his ear with finger, even when lying apparently asleep.

¹ *Integrative Action of the Nervous System*, p. 106.

d. 10. No grasp of my hair when put to his hands which were groping and jerking about. Certain 'fixation' of my face to-day when about 1 foot off. Even turns his head to look at me: more interested in my face than in silver scent-bottle. Look of great interest (motionless) when I contorted my face, especially at a yawn, and three times he opened his mouth (once only a proper yawn) when I gaped mine open. From now began occasional squint or marked turning of eyes to fixate a near object.

Certain hearing to-day. When I was nursing him I crowed like a cock, turning my head away. He stopped sucking comforter and cried lustily, vexatiously. This was repeated. Third time—a very small cry, fourth time—unpleasant grimace, but a loud fifth crow caused lusty cry again. (Stopped crying almost at once, no permanent effect. Not due to vibration of my body, I think, for there was a slight cry again when he was lying on bed by his mother, when I repeated the crow.)

From about now on (if not earlier) begin occasional new sounds, grunts of satisfaction apparently, e.g. after a warm bath. Also a sound (once or twice) just like a little laugh.

When lying on back in bath gazed at nurse's face (she was 'chirruping') and then he gave an evident large smile at her. Violent crying (when being dressed) stopped twice by rubbing on forehead. Blowing on face caused blinking of eyes (four times). No blinking when rapidly I approached a book to within 2 inches of his eyes.

d. 11. Kept eyes shut lightly in strong sun. Walking reflex much less evident, though still shown for a step or two. (With A the walking reflex was very evident on 11th day, much more so than d. 2 or d. 3; in fact, it did not show then perceptibly. Several other of A's reflexes were later in developing. B was a week overdue at birth.) Great interest in new faces, looking over shoulder long at Mrs. D. (Cf. Dearborn, d. 10.)¹ Later did not follow candle light. Toes spread when sole of foot tickled, big toe wide apart.

d. 12. Arms flexible in sleep to-day, but finger-grasp reflex present so that arms could be moved like a handle. (Not present in A's sleep d. 12. His finger grasp was not nearly so strong as B's.) When B is grasping with finger reflex, his hands jerk about long before the grasp is relaxed. Pinching (hard) of finger-ends gave no result, though hard enough to be unpleasant to adult. Sometimes B grunts in his sleep. Immediate extension of legs when held to fire (so with A), though asleep; not mere pleasure of release because it occurred again when held again towards the fire; the arms too were extended wide.

d. 13. Followed red book to right and left considerable way horizontally, moving head too; eyes get 'behind' and then move with a jerk. Also for first time I got slight vertical following movement. One of spontaneous arm movements nearly reached a bright object, leading M to say he was reaching for it.

(A general note on the period of the second and third week refers to the convulsive arm movements often noticed during nursing and at many other times.)

¹ G. V. N. Dearborn, *Motor-Sensory Development* (Baltimore, 1910), p. 9.

d. 14. Loud and long continued crying suddenly stopped by nurse's 'Brrrh' sound: this repeated two or three times. I stopped thus a howl when only the first gasp had been started. Obvious and marked concentration of attention on my face now, especially when my mouth opened and reopened. (Also in A by this time.) Also concentration of attention when I chirruped a little with my lips. From this time or earlier (see d. 10) B gazed at face of any one talking to him. (So A by d. 16 at least.) But no proof yet that sound and face associated.

The above record covers two weeks. Let us summarize the stages reached so far.

First, there is the functioning of the sucking-reflex, one and a half hours after birth: occasional squinting in the first day is soon replaced by invariable co-ordination of the eyes: there is a vigorous finger-gripping reflex, but varying from day to day. A curious walking reflex also appears. A touch on the side of the mouth causes raising of the same side. From the first few days, B seems sometimes responsive to sound and sometimes not. Sense of smell is present by the 5th day.

Hard pinching seems to cause no pain. Crying can be inhibited by swinging motion (d. 1) or by rubbing the forehead (d. 5). There is apparently fixation of an object about one foot away and signs of a special interest in the human face. A hint of imitation of yawning: certain hearing by d. 10, and distress at a loud noise; grunts of satisfaction and the first smiles; constant jerky movement of hands and also constant wriggling of the body and especially movement of head and mouth; definite signs of some control of eye and head movement—both can be held steady while he gazes at one's face.

Advances in the Second Fortnight. My notes on B show that these include the following:

(1) An expression apparently of pleasure after a sneeze—a sound like 'goo'.

(2) Now gazes long and earnestly at face of any one talking to him, and at some objects, e.g. black, shiny piano.

(3) Crying inhibited by scent held to nose.

(4) Eye-blink when face blown on.

(5) Hint of imitation of mouth opening.

(6) Cry inhibited by my playing a piano—more readily by low chords than by chords of high notes (d. 20).

(7) d. 21. Contented gurgle on being placed by his mother to feed (reported by M and nurse a week earlier). This seems the first clear association—whether with position, smell or sight.

(8) Tears observed for first time (d. 22).

(9) Throws up arms on being picked up when asleep.

(10) Food seeking still erratic—often turns away from breast when hungry, apparently moving about vaguely seeking it.

A discussion of reflexes will be given in a later chapter, but two types of responses or activities may be conveniently described here and followed to a period beyond this first month.

Sensitivity to pain. The evidence of medical observers, though somewhat conflicting, indicates that new-born infants are not as sensitive as they are some months later to pain stimuli, at least to external stimuli.¹ (They complain loudly and often enough as the result of pain or discomfort apparently due to an internal cause such as wind.) We saw that hard pinching of the finger on d. 12 caused no sign of distress in B; and my son reports that his boy D was not sensitive to a hard pinch on d. 10. But remarkable insensitivity to pain stimuli was shown by B long past the first month. The notes are as follows (on B unless otherwise stated):

d. 28. Sharp prick with toothpick caused a cry of pain to-day—but very slow reaction—about 3 secs.

d. 30. Pricks with toothpick on hand hard enough to leave marks had no effect when he was restless for food. Also hard pinching on finger caused no sign of distress. (Dearborn noticed this on d. 79.)²

d. 35. A pain cry (higher and stronger) noted *for first time*, caused by scratch (deep) on cheek, done by himself.

d. 67. A sharp pinch on finger, toe or ear has no effect. Only by taking hold of a large part of muscle of leg and pinching was momentary small protest elicited.

d. 90. Hitting on knuckles with rattle hard enough to hurt me, seemed to please him. (Miss Shinn noted on d. 97 that her niece's pounding of the fists on a hard tray apparently caused her great satisfaction.)³

d. 113. Vaccinated to-day. Not a cry at the pricking and scarce a whimper at the rubbing in—possible then it was due to being held tight. [D was vaccinated on d. 109 and 'prattled all the time; and appeared to feel nothing.'] Notes much later still show B's toughness, thus:

At 0; 5 B left on big chair.—Cries heard, and B found on floor on stomach, head held up, looking round the room (but no longer crying). Apparently he had sat up to get at his toes and rolled over. No more cries, apparently not hurt. Again, apparently not hurt either when 'crawling' and his face banged down on floor several times. Even at 0; 8, he often kicks his heels hard on a wooden floor without any sign of pain. A bleeding sore foot, probably due to this kicking, seemed to cause no distress.

I thought at first that possibly B was exceptional, but Miss Shinn noticed this frequent indifference to hard bumps shown by

¹ See Bernfeld, *The Psychology of the Infants*, p. 36. Also E. Dewey, op. cit., p. 86. The varying reports as to response to a needle-prick are no doubt largely due to the varying depths of the prick!

² Dearborn, op. cit., p. 38.

³ See *Notes, &c.*, Vol. I, p. 144.

her niece,¹ and my general impression of my other children was that while not, perhaps, so indifferent to pain stimuli as B, they were surprisingly so compared with the sensitiveness of later years. Dearborn noted on d. 79 that pinching of a finger hard enough to hurt an adult, only caused a smile, though 'much slighter pinch caused obvious pain at 0; 11.' Mrs. Moore remarks that her child during the first year displayed comparative insensibility to pain. 'A very sore arm after vaccination seemed to give him little or no pain.' 'He often knocked his head against that of a person holding him with force enough to hurt the adult, yet he, apparently, felt no pain.' And signs of insensibility to pain continued even in the second year.²

The early activity of sight. The theory that touch is the most fundamental sense in human beings and that the child follows the general evolutionary process in its early development, seems to gain little support from observations on the earliest months. In the beginning of learning sight takes the predominant part.

As we have seen, as early as d. 9 there was 'a steady looking at a definite object' and a gazing repeatedly at bright objects or a human face with apparent interest.

From now onwards for several months sight certainly was the most active sense. At a time when touch movements were still impossible, and before the clumsy explorings by touch have begun, recognition and memory through sight were well advanced. Undoubtedly sight was the supremely active exploring sense during the first few weeks and months.

The definite observation that on d. 5 B followed a moving candle with his eyes, taken with the less confident notes on d. 2 and d. 4, confirms the early observations of Dearborn (d. 1), Mrs. Moore (d. 2) and Stern (d. 4) as against the later dates when others first noted the following of an object by the eyes—Miss Shinn (d. 13), and Preyer, who was surprised to find his child's gaze following a moving object on d. 23.³ In comparing observations a distinction should of course be drawn between the (reflex) turning of the eyes towards a brighter point of the field of vision and the following of an object other than a bright light. Such following of an object (my hand and a pencil) was noted in A on d. 7. I do not know if he was tested before.

A number of other observers report such 'following' with the eyes before the end of the second week.⁴

¹ Op. cit., p. 145.

² Op. cit., p. 81. More recently, various studies have indicated similar relative insensibility of new-born infants. See K. C. Pratt's article on 'The Neonate', *Handbook of Child Psychology*, p. 186 (2nd ed., 1933).

³ Preyer, *The Senses and the Will*, pp. 43-44.

⁴ Cf. Dearborn, op. cit., d. 10.

Very soon this following with the eyes becomes more facile. On d. 13 for first time B made vertical following movements with his eyes. In A, d. 14, there was also marked concentration of attention on a face near, especially when the mouth opened.

By the end of the third week more active looking about occurs, followed by long fixation on any object especially attractive: thus

B, d. 24. Simply fascinated by black shiny piano the last few days. To-day he kept his eyes fixed on it. Then I turned him round first towards right and then left—so that he could only just see it by straining his neck round, which he did.

In the second month it is clear that sight is not simply satisfied by looking at any object in the direct line of vision. Thus on d. 53 when his eyes were fixated on an object, an interposition of my face between caused an immediate movement of the eyes away (three times running). Though he frequently gazed at my face with great interest, I found it very difficult to make him look at it by thus interposing it. His eyes always 'moved on'. (Not true of A at the same date: he fixated my face at once.)

The same was noted of A on d. 60 for the first time. By the end of the second month the exploring activity of sight is more clearly illustrated by the following note:

d. 62. When A was lying on the couch I appeared on his left. His eyes turned to my head almost at once. I crawled round (behind him) and appeared on his right this time. His head and eyes moved round together. This was exactly repeated four times.

The next clear advance of visual perception is some recognition of the mother, of which I had evidence before the end of the third month: this will be discussed directly.

The first association—through touch or bodily position. In spite of all this pre-eminence of sight during the first three months, however, the earliest certain *association* I noted was in the sphere of touch, or kinaesthetic sensation, namely, the association of a pleasurable anticipation of food with the sensations due to being held in a position suitable for nursing.

A, d. 17. Began to make the gasping noise when placed in position for nursing, or immediately when napkin touched his face—a touch or possibly smell association.

B, d. 21. Heard the contented gurgle (ugh-ugh) when he was placed by his mother to feed. M and nurse reported this at the end of second week.

Miss Shinn also reports that 'by the fourth week a certain position was quite distinctly associated with the satisfaction of hunger—long before any sight association with the breast could

be detected'. It was noted, indeed, on d. 22.¹ D. R. Major also thought the first association of his boy R was between the position of feeding and pleasant 'anticipation', which he remarked even on d. 5, and confirmed on d. 10 and d. 27.²

On d. 70 we began to try to set up an association between food-getting and mere touch sensations by rubbing on B's right temple just before he was given food. After some fluctuations this association seemed to be established by d. 77—a chuckle occurring at the rubbing when it had not occurred at mere taking up in his mother's arms.

So far the mother's face was not apparently necessary for the suggestion of food. Thus :

B, d. 85. Yapping for food. I tried to see whether the sight of his mother's face was necessary for food anticipation. Held him in nursing position—he constantly looking at my face—not exactly pleased look, though when napkin tucked under chin he chuckled and opened mouth ready when turned towards my chest.

Association with sight. By the end of the third month the food chuckle occurred also at the appearance of the mother. There was a suggestion of this on d. 75 : but more definitely on—

d. 96. Crying for food—chuckled when M appeared in front of him, before she touched him. First certain association between sight and food. The same reaction was noted on several occasions.

Major also thought that the feeding-bottle was recognized at 0; 2 $\frac{3}{4}$, although the breast was not at 0; 2.³ Miss Shinn thought that there was 'recognition' of a face at least near the end of the third month.⁴ Stern reports different reactions to a parent's face as contrasted with those of strangers also at 0; 3.⁵

Rasmussen's daughter smiled at the sight of the bottle at 0; 4.⁶ Mrs. Fenton's child at 0; 4 $\frac{1}{2}$ showed delight at the pushing up of her pram hood, as indicating going out.⁷ There is indeed a general consensus among reliable biographical studies of infants

¹ See her *Notes*, Vol. I, p. 207 and Vol. II, p. 54.

² *First Steps in Mental Growth*, p. 186. The wriggling and turning to the breast as signs of some association with smell or position must be treated with suspicion : for the child who is hungry is sure to be wriggling and 'lapping', though this may be noticed more when he is taken up to feed.

³ *First Steps in Mental Growth*, pp. 189-90.

⁴ *Notes, &c.*, Vol. II, p. 67.

⁵ *Psychology of Early Childhood*, p. 108. Mrs. Moore thought her child recognized the breast and face of the mother at 9 weeks (*The Mental Development of the Child*, p. 100). But did she allow for the possibility of association through position or touch ?

⁶ See *Ruth : Tagebuch über die Entwicklung eines Mädchens*, p. 3.

⁷ *Practical Psychology of Babyhood*, p. 154.

that by about the end of the third month at least, associations with the sight of faces or of objects may occur.¹

It should be noted that B's special expression of pleasure or eager desire at the sight of the mother was only made when he was hungry. Yet it was decidedly not a hunger cry—it was only made on the instant when he seemed to realize he was about to get his food: it was a pleasure-sound which interrupted the cry.

By d. 99 the anticipation has still more obviously 'spread' backwards, so that B makes his joyful grunts when he is being dressed (after bath) just before feeding time, though before he used to be crying with hunger at this stage.

Before the end of the first month, then, we have evidence of association with touch or kinaesthetic sensations: by the end of the third month there is evidence of association with sight sensations.

Associations with sounds. The experiment of D. K. Marquis already described, suggests that the sound of a buzzer could become associated with the anticipation of food as early as the end of the first week, though it seems possible that this was really association with vibration. Miss Shinn suspected an association of sound with the face at 5 weeks, because the baby gazed at the face so long as the person was speaking: but surely movement and expression may have been the attraction here.² Looking in the direction of a sound was noted only by 0; 3.³ Darwin reports that his child even at 0; 4, and though very sensitive to sound, could not really recognize the direction of a sound so as to turn his eyes towards it.⁴ It was noted by Preyer only at 11 weeks. Looking for the source of a sound began with B at 11 weeks. Thus:

d. 77. When I cooed to him he began to turn his head (as though looking for the face associated with sound). He did same when in his mother's arms when I spoke from side, and his gaze wandered about (on the nearest side) till he found my face where it remained fixed, and we cooed to each other with many smiles.

My own observation only afforded clear evidence of association with sounds by the end of the third month. I felt one could not rely on casual observations and so on d. 100 carried out the simple

¹ That my own earliest surmises of such visual associations (at 0; 2½) were probably right is suggested by recent experiments in which six infants were shown coloured lights for a few seconds before and during feeding from d. 14 onwards. Finally a day or two before the age of 0; 2 the mere exposure of the light led to hard sucking by each of the six infants, though the reflex was unstable. See 'The Formation of Visual Conditioned Reflexes and their Differentiation in Infants', by N. I. Kasatkin and H. M. Levikova, *Jour. of General Psych.*, 1935, Vol. 12, p. 416.

² *Notes*, Vol. II, p. 120.

³ *Op. cit.*, p. 129.

⁴ *Mind*, Vol. II, p. 286 (1877).

experiment of making sounds behind B towards left or right and noting the direction of his turning.

The results of the experiment were as follows :

Voice sound made behind infant			
	<i>To right</i>	<i>To left</i>	<i>To left</i>
Infant turned	1. Neither way		8. R.
2.		L. (slightly)	9. L.
3. L.			10. Neither way
4. R.			11. R.
5. Neither way			12. R.
6. R.			13. L.
7. .		L.	

Here is clear evidence of sound direction association : (or the maturing of innate perception of sound direction) by 3 months. In this test there was only one incorrect turn, against eight correct.¹

The training of the functioning of sensations of touch, sight and sound up to the first associations has led us beyond the stage of the 'new-born' and we must go back now to consider movements and their control.

¹ Miss Shinn, in spite of her most thorough observations of sense development, writes : 'I have no doubt that I failed to observe the early stages of development' of the association of sound and visual direction. She rightly points out the danger of interpreting, as due to such an association, the child's looking in the accustomed place for a person on hearing her voice. (Op. cit., II, p. 122.) The case is a good example of how a simple experiment is sometimes worth more than many casual observations.

CHAPTER VI

Spontaneous Movements and the Beginning of the Control of Movements

Constant spontaneous movements in the first months. Many observers agree in reporting constant movements of normal infants in the first few weeks of life. As the baby lies on its back, there is random kicking, twisting of the body, turning of the head from side to side, movements of hands and especially constant movements of the mouth. Even the toes, I noticed in B on the first day, 'are very active, closing and opening spontaneously'. These movements continue for several months. Thus

B at 0; 2. Mouth and hands in constant motion as he lies happy on the couch. 0; 0 $\frac{1}{2}$, the hands are constantly opening and shutting and sometimes scratching his eiderdown, sometimes the fingers are moved over the lips or clutched in the mouth.

Here we see possibly the first meeting of spontaneous random and deliberate voluntary movement, to which we shall refer again later.

At first all these movements seem to be purely spontaneous—due, no doubt, as Preyer states, to the internal development or to changes within the organism¹ including, at times, gastro-intestinal activity,² apart from any specific external stimuli, though the general stimulus of the new environment the child enters at birth must have its effects, new impressions coming through sights and sounds, through pressure, air, temperature, and so forth. In any case, these spontaneous movements are not strictly reflexes in that they are not specific responses to specific stimuli: they frequently appear as a form of mass-activity owing to the as yet plastic, unorganized nature of the nervous system.

The movements are often very vigorous. One of the babies observed by Miss Shirley almost turned himself over by kicking on d. 5, another rolled from abdomen to side on d. 8. Another at 3 weeks, by a kick, pushed the light table, on which she was lying, several inches. Miss Shirley remarked that of the twenty-four babies she studied, the smaller, weaker and premature babies were at least as active as the others.³

¹ *The Senses and the Will*, p. 203 (Appleton, 1909).

² K. C. Pratt: chapter on 'The Neonate' in *Handbook of Child Psychology*, p. 199.

³ *The First Two Years*, Vol. I, p. 47 (Univ. of Minnesota Press, 1931).

The apparent aimlessness of spontaneous movements. Most of these spontaneous movements in the early weeks seem quite aimless. My own observations confirm the impression of Preyer and Miss Shinn that often there is a tendency towards a resumption of the prenatal position—the legs, for example, being constantly pulled up; but most of the jerky movements of head, hands and arms are no part of any such tendency. Some of the movements of head and mouth perhaps justify the term I have used above, namely, ‘food seeking’. One medical woman of my acquaintance, who made careful observations on the feeding of babies in the first few weeks, thought that such an inherent tendency to seek as well as to suck was shown in the first days by several of the infants she had observed.

Most of these spontaneous movements, however, seem purposeless. Yet they have a physiological value in providing the first exercise of the muscles, and a psychological one in providing the infant with the first experience of sensations due to movement, which are to be of use later in acquiring the power of voluntary movement. This is further suggested by the fact that they tend to cease as voluntary movement develops. Miss Shinn speaks of their being *inhibited* by voluntary movements,¹ but if the above account of spontaneous movements is substantially correct, and especially if their main purpose is to prepare for voluntary movements, their gradual cessation would be expected as volitional movements develop.

Some of the movements which are apparently spontaneous and aimless may really be a type of defence-reflex, as when the child turns its head from a very bright light, or from the breast on repletion. In particular, more vigorous wriggling of the head may result if an infant's breathing is hindered by its position. One experimenter found that of fifteen new-born infants, all but one when laid face downwards on a pillow turned the head sufficiently to free the face. ‘Even the sickest babies could do it when the air supply was cut off.’² It is, I think, impossible to say whether this should be labelled a reflex, or whether it was a stimulation of vigorous, random movements until a satisfactory condition resulted. It seems more like the latter; and certainly most of the spontaneous movements seem incapable of interpretation as defence reflexes.

Stimulation of spontaneous movements by excitement and inhibition by attention. Within the first month these spontaneous movements tend to be more vigorous at times of special excitement, whether pleasurable or the reverse. Already on d. 1 more restless move-

¹ Notes, &c., Vol. I, p. 180.

² M. G. Blanton, ‘Behaviour of the Infant in the First Thirty Days of Life’, *Psych. Rev.*, Vol. 24, 1917, p. 465.

ment was reported to me during sleep at the noise of a passing train. Dearborn mentions 'very general sthenic activity,' as an expression of enjoyment in the 7th week.¹ The movements may not be expressive in the sense of communicating an idea of the feelings expressed to an ordinary observer; but they are in the sense of being the visible accompaniment of such feelings.

On the other hand, keen attention to some sensory impressions seemed to stop the spontaneous movements at an extraordinarily early age. For example, I noted, in B on d. 10, that he showed great interest not only by gazing steadily but also by becoming motionless when I contorted my face. Dearborn noted on d. 9, 'She stopped her incessant movements when a watch was held close to her ears.' Gesell noted at 0; 1, 'a temporary cessation of random movements' when a child's attention was 'absorbed' by the touch of a feather on his brow.²

One marked peculiarity of the first muscular activities of B is mentioned in notes already given under days 5, 7 and 9 referring to the strong resistance to passive movement (lessened in sleep) and the jerkiness of these early arm movements. (Also noted by Mrs. Moore.)³ By d. 15, passive movement of the arm was noted as being much easier, and by d. 64 still more so in both A and B, and active movements less jerky, more steady and continuous.

When some specific stimulus affects the child—such as loud noises, or the stimulus which produces a sneeze, similar movements to the spontaneous ones join in a *general* response. There seems to be an overflow response of the organism as a whole. But these responses seem of a reflex type and I shall refer to them again in the chapter on reflexes.

My own early notes record that general conditions of pleasure and pain seem to affect these spontaneous movements: e.g. kicking and stretching out the legs are more frequent when the child is bathed or held in front of a fire or when approaching food: grimaces and twisting are more frequent when the child is uncomfortable. (Cf. Shinn, op. cit., Vol. I, p. 300.) Thus these spontaneous movements are already tending to become expressive movements, which shortly after the first weeks become more and more *specific* instead of general reactions.

Co-operation with reflexes. We must anticipate the discussion of reflexes to refer to certain very early reflexes with which in these first days some spontaneous movements seem to co-operate. As already mentioned, movement to and fro of the head and constant activity of the lips are characteristic of the newborn. At

¹ Op. cit., p. 19.

² *Mental Growth of the Pre-school Child*, p. 203 (New York, 1925).

³ Op. cit., p. 11.

the same time we find appearing in the midst of these gropings, a special groping response to touches near the mouth. Thus,

d. 2. Tickling of B's mouth on one side caused raising of upper lip on same side. Also in first week when Y was touched on right cheek that side of the mouth moved outwards as though to meet touch. B, d. 16. Four times got lip lifting on left side by touching it there, but four times failed on right side. The test succeeded with A on d. 35 (though it had failed with him on d. 2) and with B again at 0; 2.

These might be regarded as 'seeking reflexes', helping in the search for food and appearing among spontaneous movements which assist the search.¹ They may have also served as defence reflexes which various observers have mentioned.

Development into defence movements. Certainly these apparently random movements are brought vigorously into play when the infant has any apparently unpleasant experience and appear at times to function as defence movements. This we often observed in the first few weeks, when, for example, the child's nose was cleaned with wool. More definite evidence is given by some careful if rather unkind experiments, by M. and I. C. Sherman, described in an article entitled 'Sensori-motor Responses in Infants'.² These experiments were carried out upon a group of nearly 100 infants in the first few days of life. Pressure was exerted by the finger on the chin of the infant to an extent which became unpleasant to him. About thirty tests were given. It was found that in the first few hours the result was simply the throwing of the arms about in a purely random way, the offensive finger only being struck apparently by pure chance, and that only rarely. A gradual increase in the contacts, however, seemed to take place, though no infant made really successful defence movements within the first twenty-one hours, the criterion of successful defence being such co-ordination as enables both hands to join in pushing away the finger, perhaps rather a severe one. By just over four days, however, the defence movements were fairly regular, though further improvements were found to be going on even after twelve days.

This experiment indicates that these apparently random movements can eventually come to serve for defence purposes and can eventually set up fairly efficient, selected and immediate defence movements, selected perhaps by mere trial and elimination of error.

¹ J. Thompson reports a somewhat different response to taps on the upper lip (namely, a jerk, closing and then pursing the lips) which he found in the healthy new-born when asleep; he says it is rare when awake, yet he thinks it is useful in assisting the infant's first attempts at sucking (*Review of Neurology and Psychiatry*, 1903, Vol. 1, p. 145: quoted by R. Dewey, *op. cit.*, p. 131).

² *Jour. of Comp. Psych.*, Vol. V., 1925.

This seems to be true, even if the authors put the adaptation at somewhat too early an age.¹ But their constant variation, the slow elimination of futile movements, and yet their general direction towards a change in the unpleasant situation are suggestive of something more than a reflex or even a series of reflexes; to use a sentence of L. T. Hobhouse in his description of conation, 'The effect is less than purpose, yet it is more than a reflex because it is the outcome of a persistent uneasiness.'²

A strange blending of a defence reflex and non-reflex movement also occurred in Y during sleep on d. 19.

Scratching of her right cheek with a straw as she lay asleep on her left side, caused a slow raising of the right arm nearly to the cheek (by restless movements, not of a rapid reflex type, which occurred the same day in response to a jerking of the cot). Later, as she lay on right side, touch of left cheek caused similar movement of left arm.

On d. 20 this was repeated and this time after 'restless movements' the straw was actually grasped by the hand.

Development into habits. This hint of the co-operating of what are usually aimless movements with a somewhat uncertain reflex is supported by observations of co-operation with a different reflex. In the first days of life in the course of spontaneous random movements the hand may approach near enough to the mouth to stimulate this mouth seeking, and a part of the hand, especially the thumb, may get between the lips and be seized and squashed. Thus B was found to be sucking his right thumb on the first day—and sufficiently often for me to note: 'only right hand sucked so far.'

Dearborn also noted on d. 1 that his daughter sucked the left hand more often than the right, and on the 5th day both hands equally. On d. 5 I noted that neither M nor I had seen B suck his left thumb. A note on d. 4 states that A had not yet sucked his thumb (in general A's reflexes and movements were somewhat later than B's), but it was seen on d. 7.

Again

A on d. 45. Sucks his fist when he gets it near his mouth. Hand is waved about near his mouth occasionally as though learning by trial and error were already at work. (On this day his 'comforter' was given up.)

At what stage this getting of the thumb to the mouth becomes a habit so that when the craving occurred the movement was made, I am not sure. Certainly the act became more frequent even in the first week or two. But we cannot guess how many of the

¹ As suggested by the recent experiments made by E. E. Daniels and M. Maudry—outlined in *Psychological Abstracts*, Feb. 1936, No. 1231.

² *Mind in Evolution*, p. 57 (London, 1915).

other vague random movements may have also been stimulated by the craving to suck—but without on these occasions the right ones occurring.

Mrs. Moore also records the frequent sucking of the thumb or fists in the first week and yet the incompleteness of the adjustment even by the 10th week (op. cit., p. 12). Miss Shinn's daily watching of her little niece left her in similar doubt as to the appearance of 'unmistakable purposive effort of the hand to reach the mouth' until the 9th week (op. cit., Vol. 2, p. 85). Before that she had the impression, as I had, that there was mere learning by trial and error. She noted one remarkably successful series of movements of hand to mouth some half a dozen times in succession when the hand was continually pushed away; but she regarded this as an 'incipient association' quickly lost (op. cit., p. 86). On the other hand, M. G. Blanton, referring to a baby who got his finger into his mouth six times in the first two hours after birth, writes that the action was not fumbling once the sucking had started, as it did when the baby's hand touched his face above or below the mouth. Only 3 of her large group of neonates were unable to get their fingers in their mouths and they were children of either one or two retarded parents.¹

We shall see in the next chapter how gradually voluntary control of the hand-movements is learned, a good many weeks later; it seems probable that this early carrying of hand to mouth in the first few days is partly due to an innate tendency not quite automatic and effective enough to be called a reflex, and gaining some improvement by trial and elimination of error, and that it forms an example of that curious principle already mentioned which marks the development of a number of mental capacities, namely, that they may appear in a crude form on a low level and then reappear later in a more permanent and useful form.

The beginning of control of movements. In the preceding paragraphs we have referred merely to the development of these spontaneous movements when left to the stimulation of the infant's own positive cravings. That they may be quickly trained under experimental conditions is clearly shown by the experiments already described by the Shermans on sensory and motor responses.

Nevertheless, they still lack the exact adjustment of more deliberate and consciously learned voluntary movements. Even in the fourth and the sixth month Preyer noticed that two infants who suffered from local itching eruptions of the skin, especially on the head, were very clumsy, scratching severely some parts not affected.²

At this stage a note on another kind of action also suggests that a specific craving might stimulate general activity.

¹ Op. cit., p. 478.

² *The Senses and the Will*, p. 223.

d. 27. M says B often seeks the breast by turning *away* from her even when on her knee—i.e. he has learned to wriggle (or wriggle more actively) when craving for food, but he is not yet guided by position.

Though a craving to suck his thumb no doubt stimulates greater activity of hands and arms, no really efficient habit of the kind was formed by the 10th week. I noted then :

B, d. 67. His rough banging of his right hand against his face looks like the beginning of voluntary movement—or at least movement guided by vague desire to get his fist into his mouth, as they cease for a time when this is accomplished.

But a note on d. 72 makes it more probable that voluntary control is beginning.

d. 72. While he was sucking his right fist I drew it away from his mouth and straightened the arm : the hand was moved up again towards the face, first too high, then hitting the nose and eventually back to the mouth. This was repeated several times—sometimes the hand going almost straight back to the mouth. Once or twice when he was staring earnestly at something he made no such effort.

This looks like the first genuine learned action. It was also in the 10th week that Miss Shinn recorded 'unmistakably purposive efforts of the hand to reach the mouth'—the earlier findings of the mouth by the hand being mere chance results, she thought.¹

We shall see in the chapter on reflexes that this was precisely the date when reflex grasping seemed to become involved with voluntary movements.

After the second month there are further signs that these apparently restless spontaneous movements may be prompted, and guided, though not at first very efficiently, by some vague end towards which the infant is working by trial and error. This is indicated, for example, by a note—typical of much activity at this period—on

d. 67. B was restless—got his right fist into his mouth. I put a newspaper over him : he cooed, wound his arms about it and in about two minutes was embracing part of it and had it against his mouth.

Here is the beginning of a rather complex movement of both arms, bringing an object to that much desired end, the mouth.

The signs of voluntary movement : (a) slow speed. The deliberate slow speed of the movement also distinguishes the new voluntary from the spontaneous movement. Thus

d. 80. Right hand, when taken away from mouth, goes slowly but steadily back to right side of upper lip and then moves along into mouth. The left hand moves up more jerkily after the right to near the mouth.

¹ Notes, Vol. II, p. 85.

But there was no movement of left hand when I held right hand fast, as a substitute for it.

This deliberateness is shown still more when the art of grasping is just matured. Thus

d. 108. Ceased happy cries when I held rattle before him. Hands were at first quite still—not for a long time (? 1 or 2 minutes) did they move there, very slowly. Left approached and touched rattle (6 inches from face): then right came up and began fingering round it and soon both had hold—eyes fixed on it all the time.

(Remember it was also the right hand that was more readily sucked.)

(b) *Looking at the moving hand.* Again, looking at the moving hand is a new symptom of voluntary movement,

d. 80. Looked at left hand as he moved it towards his mouth (first time observed). d. 85. New leg movements observed. (1) One leg only, the upper one drawn up and down and (2) both legs, outwards spreading movement.

A, always somewhat behind B, on

d. 84, gets his hands to his mouth without looking at them, or trying to look at them, apparently not helped at all by sight. d. 93. A often looks at right hand as he moves it about.

Spontaneous movements continue after voluntary movements have begun. Thus B:

d. 80. There are periods of quietness nowadays—after a feed, for example. But generally when awake, eyes, head, hands and feet are in frequent motion. d. 82. Jerky, impulsive movement of arms and legs still present though others developing. d. 83. Repeatedly carries his dress up towards his eyes with both hands and gazes at it (shown by marked convergence of eyes). Once got it quite close up to his left eye and held it there till he cried. First time I have noticed anything like this.

Conflict of volitional with spontaneous movements. Spontaneous and voluntary actions sometimes appear actually to conflict.

d. 87. A was holding right fist fairly steadily (the arm almost fully stretched out) in front of his face and gazing at it, eyes converging; hand waved and occasionally made sudden jerks away as though a spontaneous movement interfered with steady voluntary holding. Meanwhile the left hand was jerking about or grasping dress and moving it about—obviously at a stage of earlier development.

Mrs. Moore also noticed that spontaneous movements in the 10th week jerked the hand away when the thumb was being sucked.¹ Similarly a reflex grasp may interfere with voluntary movement, as we shall see in Chapter VIII.

¹ Op. cit., p. 12.

Meanwhile the exploring of the hands is beginning.

d. 88. M says that B was touching fingers of one hand with other to-day, looking at her meanwhile.

d. 92. Often looks at his hand as he moves it about, and has done for about a week. Also there is more exact feeling of his hands. d. 95. Feels his hands and fingers now with thumb and finger.

Co-operation of sight and touch with spontaneous movements. Finally, the co-operation of sight and touch with spontaneous movement plus reflex movement is seen, sight at first providing a stimulus for grasping. This complication of the grasping reflex and the first stages of co-operation of the hands and eye must be approached not only from the point of view of spontaneous movements, but also of reflexes, which we shall treat in Chapter VIII. But the gradualness of all this transition and the apparent co-operation of spontaneous and voluntary movements are perhaps best illustrated in a still later note on o; 3½.

d. 97. B gazed at rattle as he held it in his hand lying on couch: when he extended his arm, rattle passed out of his sight and he cried. (Apparently B has not yet learned to move things to his face from that distance and position, but only when arms are flexed at elbow—this shows how gradual and partial is learning of motor adjustments.) At last apparently random movements of arm brought rattle back into sight; and then there was the slow deliberate movement of hand and rattle—quite different from random movements.

Certainly the very craving to put things to the mouth seems eventually to guide and fix the random spontaneous movements into a habit before deliberate voluntary grasping is possible. Thus I noted of

A on d. 104. Readily puts his rattle to his mouth; but when his rattle is held up to him he cannot grasp it, though he moves as though he were trying to get it.

There was finally clear evidence of grasping suggested by sight at o; 3½, which will be given in the chapter on reflexes. But long after efficient grasping has developed within certain limits, active random movements continue, as shown by a note at o; 5½. d. 167: B rarely hits himself in the face with a spoon now: he has learned to inhibit the impulsive-movements-state present two or three weeks ago. (Even doubling the limit of this vague statement, six weeks would only bring us back to d. 125.)

Order of transition from spontaneous to controlled movements. One final comment must be made on the transition from spontaneous to controlled movements. It seems to take place first in the movements of the eye, the random movements of which seem to be

replaced by a more deliberate moving very early. The transition is hard to note, partly because of the very early reflex following of a light by the eyes; but spontaneous movements of the eyes from the first seem relatively slight and orderly compared, say, with those of the hands and legs. On d. 9 I noted: 'Considerably greater control of eye movement. Silver brush followed with eyes, but he soon gives up; this giving up seems itself a sign of voluntary control rather than reflex.'

Next comes the control of the head, which appears largely as a kind of maturing. It is difficult to trace a transition through learning except perhaps by the gradual elimination of useless spontaneous movements which jerk the head about. By d. 13 the steady movement of the head in following a light was noted.¹

By d. 14 the head could be held steady enough to gaze for a time at the face of any one talking to him. Not long after there seems to be some control gradually developing in the art of seeking the nipple. Next come the arm and hand movements as we have seen—and later elimination of random kicking and the beginnings of creeping and walking. My own records add another to those biographical records which Miss Mary Shirley points out agree with her own findings as regards motor development. They all point to the fact that 'motor control sweeps downwards from the eye and head region towards the lower trunk . . . and sacral regions'.²

¹ M. G. Blanton (op. cit., p. 461) reports that one infant under her observation was able, even just after birth, to follow a light and to turn her head back to it when it was turned away.

² See her chapter on locomotion and visual-manual foundations in the first two years, in *The Handbook of Child Psychology*, p. 247; also *The First Two Years*, Vol. II, Chap. 18.

CHAPTER VII

The Earliest Expressions and Causes of Feelings or Emotions

The nature of the first feelings and expressions. We have seen that the responses in the first few weeks consist largely of a considerable *general* response of the whole organism, and that specific reflexes are differentiated only gradually.

Similarly at first the expressions of individual feelings or emotions are not clearly differentiated. It has indeed been suggested that at first the infant's only experience of feeling or emotion is 'a general disturbance or excitement' which in a short time (perhaps days or only hours) is differentiated into (a) distress and (b) delight: and that only later is the distress differentiated into Fear, Anger, Sorrow, and so on.¹ Another view is that in the infant we can discern 'four elementary emotional patterns', namely 'resistance' (later becoming anger), 'content' (becoming joy), 'startle' (fear) and 'gloom' (sorrow).²

On the question as to whether the first stage is really a general excitement, neither pleasantly nor unpleasantly toned, we can only surmise; but it would hardly be consistent with the process of development later. No doubt the first cry of the new-born does not express the wrath that Kant attaches to it, nor the 'overwhelming sense of inferiority on this suddenly being confronted by reality without ever having had to deal with its problems' which is the delicious interpretation attributed to Adler.³ Indeed, the first cry is rarely spontaneous, a sharp slap being often necessary.

This first cry is usually thought to be merely a reflex. But unless we continue to interpret further cries as reflexes and not as expressive of any distress, we may reasonably suppose that within the first few hours we have signs of discomfort, and that within a few days, if not hours, we have signs of satisfaction.

We can here only use the following method, admittedly fallible; when specific signs (e.g. crying), later known to be associated with certain feelings, begin to appear in situations which one would

¹ See K. M. Bridges, *Social and Emotional Development of the Pre-School Child*, p. 200 (London, 1931). See also John J. B. Morgan *Child Psychology*, p. 58 (revised ed., London, 1934).

² H. L. Hollingworth, *Mental Growth and Decline* (1922), quoted by J. J. B. Morgan, *op. cit.*, p. 59.

³ This is quoted from Dr. W. A. White, but without exact references, by M. G. Blanton in 'The Behaviour of the Human Infant during the First Thirty Days of Life', *Psych. Rev.*, Vol. 24, 1917, p. 458.

expect to cause such feelings (for example, those associated with pain), then we may surmise that the crying is an expression of pain.¹

True, this can only be surmise, for we are ignorant as to the way in which feelings or emotions change by mere maturing, and also as to whether expressions do not change somewhat their associations and become linked with different or more complex feelings.

It is conceivable that at this early stage many at least of the finer expressions of feeling (e.g. facial expressions) are simply random spontaneous movements as yet unassociated with any feelings at all—just as for months the spontaneous making of vocal sounds carries on without any association with meanings. Indeed, this certainly seems to be true of facial expressions.

As almost every conceivable expression flits over the face of a baby under one month in the course of a few hours, from one suggestive of the profound reflection of a philosopher to the whimsicality of a George Robey and thence to the determined resolution of a Mussolini, we can hardly rely on these general impressions. Nevertheless, a sensitive observer who is constantly with the infant comes to detect certain characteristic expressions frequently recurring in certain circumstances.

One of our guides in the interpretation must be the existence of such a continuous series of similar expressions under similar conditions and in response to similar stimuli, continuing to an age when it becomes clearer that the expression is what we took it to be, and even to a time when children's own reports can substantiate this interpretation.

Is displeasure predominant at first? Proceeding upon this method of interpretation we find that in the first few days of life there are undoubtedly more vigorous expressions of dissatisfaction than of satisfaction. This is not surprising in view of the fact that it is more important that an infant should give warning to its mother of hunger, discomfort, fear or pain, than it is that he should give signs of pleasure. Biologically the expression of pain seems to be more primitive than that of pleasure. Animals generally give definite expressions of pain, but few of pleasure, at least such as are readily apprehended by human beings, like the purring of cats and the dog's wagging of its tail. (Birds seem an exception if song only accompanies pleasure.) Decerebrate cats and dogs can be made to give pain snarls, but usually no purring or mimetic signs of pleasure.²

¹ The reader may be referred to the discussion of Behaviourism and the interpretation of responses given in Chapter II, p. 39.

² C. S. Sherrington, *Integrative Action of the Nervous System*, p. 255. Dr. Head, however, in a paper before the British Psychological Society, once described a cat which had been decerebrated but which could be made to purr!

Hemicephalic children cry loudly even in the total absence of the cerebrum and mid-brain. Darwin, however, points out that the microcephalic idiots show the 'brightening of the eye' when pleased.¹

It is unjustifiable, however, to assume from the more forcible expression of dissatisfaction that in the first few months of life, satisfaction is overbalanced by displeasure: or even, as Preyer does, that 'unpleasant feelings are more frequent than afterwards'.² Some records may suggest it; thus, five infants who were observed during the first four months were noticed to cry or otherwise express apparently unpleasant feelings about one thousand times each on the average during that period.³ That sounds bad, but it only amounts to an average of about eight cries a day, and these may be brief and leave much more time for satisfaction. My own decided impression of all my five children was that periods of contentment and apparent enjoyment were far more frequent than displeasure, even during the first few months, however much more vociferously the latter might be expressed. Miss Shinn reports the same impression of her niece, and adds that her inquiries lead her to conclude that there is something wrong with the health or treatment of an infant if this is not so.⁴

In the first few weeks of life the cry is of course the most prominent expression suggestive of unpleasant feeling, and in view of its known later connexion with unpleasant feelings we may assume that at very early stages it indicates dissatisfaction or displeasure, or even pain of some kind. The cry associated with the first inhalation after birth is thought by some to be unaccompanied by pain, and we cannot be certain that all the early cries are responses accompanied by displeasure. Certainly the easy inhibition of loud crying in the first few weeks—by a mere rubbing of the forehead or holding a watch to the ear or playing a chord on the piano, suggests that the state indicated by much loud crying is not as utterly miserable as its sound implies to an adult, or else that the general feeling tone can change with extraordinary rapidity at this stage. As we have seen, infants without a cerebrum or mid-brain may cry lustily.⁵

Early causes of crying. Among the earliest apparent causes of crying were the following: *hunger*—from the first few days, and

¹ *Expressions of the Emotions*, p. 211.

² *The Senses and the Will*, p. 146.

³ See *The Development of Emotion in the Infant*, by W. E. Blatz and D. A. Millichamp, p. 14 (Univ. of Toronto Press, 1935).

⁴ *Notes, &c.*, Vol. I, p. 237.

⁵ The inhibition of crying is discussed in more detail in Chapter VIII on Reflexes, p. 117, partly because of the special interest attaching to problems of inhibition for the student of reflexes.

pain from 'wind' or other causes. Within the first few weeks mere *waking from sleep* seemed to be often followed by crying, at least until some one took the child up. On d. 5 I noted of B: He wakes first with slight grunts, movement of arms and then yawns, then louder cries and greater movements.

At a very early age *loud and sudden noises* caused crying. On d. 10 my crowing like a cock caused B to stop sucking his comforter and cry lustily—and so three times.

Manipulation (as in dressing the child) seemed to cause crying in the first month. It involved restraint of arms and legs which were constantly moving.

Crying *when lonely* seemed to occur during the first month. Thus

d. 29: long continuous crying in his cot was stopped at once when I took him beside me in my bed. There might have been pain here which was relieved through movement. But on d. 62 B was crying, but quietened when I came within about $1\frac{1}{2}$ feet of him—from about 5 feet previously, and at 0; $3\frac{1}{2}$ 'Cries violent when I go out of his sight and chuckles when I reappear, even if I don't talk to him.' This was noted several times as a new phenomenon of these last few days, at least in such a marked degree.

In the first month crying at *loss of support* occurred, when on d. 20 B, in his bath, partly supported by his nurse, was clutching my hair, and as I raised my head his clutch gave way and he dropped with a short sharp cry.

In the first month sponging of his head caused a trembling of the lower lip, but without a cry always following. Another variant of the cry was the squaring of the lip, which appeared at least by d. 46, when I crowed like a cock. This happened several times, being followed, not by a cry, but by a deep sigh.

Crying was at first tearless, but tears were noted in B on d. 22. Great differences appear in the dates of first noting tears. D. Taylor Jones reports tears in 'one or more' out of seventy-five babies tested on the first day.¹ Mrs. Moore noticed tears as early as d. 10,² but notes later in 16th week: 'tear secretion established'. Darwin noted falling tears in his own child only on d. 139 and adds it is 'well known to nurses and medical men' that infants whilst young do not shed tears.³ Dearborn first saw tears rolling down the cheeks of his daughter on d. 48. Charlotte Bühler only notes tears appearing in the second month.⁴ M. G. Blanton, among a group of infants observed in a maternity ward, records tears in

¹ See Evelyn Dewey, *Behaviour Development in Infants*, p. 71.

² Op. cit., p. 37, and p. 38.

³ *Expression of the Emotions*, p. 154 (Popular ed., London, 1904).

⁴ *The First Year of Life*, p. 37.

one infant on d. 4 and another on d. 6.¹ A woman doctor whom I knew to be a careful observer, among nine infants of whom she kept records during the first few months, noted in one girl tears rolling down her cheeks when she was first washed. Even allowing for errors of some days owing to missing first occurrences, it seems probable that there are marked individual differences in this very fundamental expression.

Katherine M. Bridges, on the basis of observations on twenty children from 2 to 5 years, states that tears only come with mixed emotions, that pure pain or anger cries are dry.² She does not, however, give details of her evidence for this, and it would seem very easy to overlook the appearance of tears in loud crying unless they were specially looked for.

The gradual differentiation of expressions of displeasure. The lack of clearly distinguishable expressions of different feelings or emotions in infants in the first few weeks was indicated in a long series of experiments by M. Sherman.³ Nearly 100 infants of normal health were observed from the third to the seventh day, and they were submitted to the four stimuli: (a) hunger, (b) dropping two or three feet, (c) restraint of movement of the head and face, and (d) pinpricks. Cinematograph records were taken of the responses of the infants and these were then shown to various groups of medical and psychological students and nurses, who also observed the infants themselves on occasions. It was found that when the various judges did not know what the stimuli were they were hopelessly divided in their judgement as to the kind of feeling expressed. Thus the graduate students said that *anger* was expressed (1) in 11 cases when there was hunger, (2) 14 cases when the child had been dropped through space, (3) 13 times when there had been constraint of the head, and (4) 8 times when there had been a pinprick.

Even when the observers were told each type of stimulus before being shown its result there were thirteen different emotions named for the photograph taken after the hunger test, the most frequent of them being anger.

In another series of experiments⁴ judgements were asked for concerning four types of cries following the same four different kinds of stimuli; and again there was little regular relation between the judgements and the stimuli concerned. The author in a later

¹ See 'Behaviour of the Human Infant on the First Thirty Days of Life', *Psych. Rev.*, Vol. 24, 1917, p. 463.

² See *Social and Emotional Development in the Pre-School Child*, p. 104 (London, 1931).

³ *Jour. of Comp. Psych.*, Vol. 7, 1927.

⁴ Reported in a second paper also in Vol. 7 of the *Jour. of Comp. Psych.*

paper concludes that emotional responses are undifferentiated, but goes on to say that they vary with the degree of the stimulus, and that the internal pain-cry is more spasmodic than that due to hunger. His observations showed that the general reaction of the legs, arms and body was dependent on the strength and duration of the stimulus. The holding of the breath, spasmodic breathing, supposed usually to be characteristic of special emotions, were also obtained by pricking with a needle if that was done sufficiently.¹

The question may be raised whether some elementary form of anger may not be roused by any objectionable sensation if continued long enough. But even so, it seems that expressions at this early stage intermingle in a way which makes it impossible for the ordinary observer at least to be certain as to what feeling is being experienced.

Sherman, however, does recognize two main types of reaction, namely 'acceptance' and 'rejection', the latter being further divisible into 'avoidance' and 'aggression'. Even in the early weeks, if turning the head away does not free it from restraint, then arms begin to wave about as though there were vague and random efforts to push the restraining hand away. In these early days, however, avoidance apparently predominates over aggression, and Sherman only found after 10 or 12 days that the change to aggression, if avoidance were not successful, came more rapidly.

Some writers on child psychology assume that these experiments of Sherman prove that there are no differences of feelings and emotion in the first month; but of course they do not prove that. They do not even prove that there are no distinguishable modes of expression at this stage—if only we knew what to look for: they only prove that the judges differed in their interpretation of the various *expressions*, i.e. that the expressions are not such as untrained adults would agree in interpreting as attached to specific feelings or as being in accordance with their general interpretations of facial expression, whether intuitive or due to experience.

By the end of the first week (the period studied by Sherman) almost hourly observations of the same infant day after day enabled me to discriminate different cries with some reliability. From about the end of the second week two different kinds of cry were clearly distinguishable in B and less clearly in A: (i) the cry of hunger, each cry growing crescendo to a bitter outburst and then stopping; and later, a yapping cry often sudden and explosive; (ii) a pain cry (due, for example, to wind), much louder and more continuous. On d. 47 I noted: Hunger cry has now an uplifted musical note in the middle. Not much later and perhaps as soon, a third type of cry seemed associated with more general discomfort—e.g. dampness or cold.

¹ *Jour. of Comp. Psych.*, Vol. 8, 1928.

The interpretation of these cries was often checked by finding what kind of treatment satisfied the child; my wife and I well remember the insistence with which I sometimes interpreted a particular cry of B as a hunger cry, when the enormous meal he had consumed made it almost incredible, and yet the interpretation proved to be true.

Stern noted a similar differentiation 'a few weeks' after birth,¹ as no doubt many mothers think they do. Preyer thought that the pain and hunger cries were distinguishable from the first few weeks. Experiments made by D. Klein with an oscillograph to obtain graphic records of the cries of babies also suggested specific cries for hunger, fear and rage. Klein's work, however, is not published, and Miss M. C. Jones, who refers to it, does not give the age of the babies tested, though apparently they were classified as 'new-born'.²

Further refinements of method and careful study may of course reveal expressions that are regular and usual for the particular kind of feeling or experience. I myself thought I noted a 'vexatious' element in some crying as early as d. 10, and Darwin refers to an expressive frown on the 8th day.³

Some other forms of expression appear before the end of the first month, for example, a trembling of the lip, noticed both before and after a bath. I was not certain whether this was an early differentiated expression of fear, though it looked like it. By the end of the first month I noted the throwing up of the arms at a jolt or loud noise during sleep, which I include among reflexes in the next chapter. At least by 0;2 this reaction appeared in response to a loud strange noise, even during waking.

Individual differences. Finally, in the various ways and degrees of expressing dissatisfaction in these early months, there are great individual differences.

I have already remarked on the markedly placid nature of A in the first 6 months as compared with B. With A there was less crying, less cooing and moving and less laughter.

In reference to general 'irritability' a wide range of individual variations has been found by Miss Shirley in her group of 24 infants observed from birth to the end of the second year.⁴

The types of responses noted were screaming, crying, 'fussing', 'no emotion', smiling and laughing aloud. The score of irritability was based on the frequency of screaming or fussing, which

¹ *The Psychology of Early Childhood* (p. 125).

² See M. C. Jones's chapter on 'Emotional Development' in *Handbook of Child Psychology*, p. 274.

³ *Mind*, Vol. II, p. 287.

⁴ See *The First Two Years of Life*, Vol. III, Chap. 2.

presumably means some complaining noise combined with avoidance movements and restlessness. The frequency of these was recorded during the three different kinds of tests—physical, anthropometrical and psychological. The point of special interest to us at the moment is the fact that the ‘irritability’ as so tested in the physical tests was high in the first few weeks, somewhat higher from 3 to 12 weeks, then showed a substantial drop in the period of 3 months to 6 months, and a further drop from 6 months to 2 years.¹ There was a similar drop in the scores for irritability shown in the anthropometrical tests from the score of the first three months to that for the period 3 months to 6 months; and a further substantial drop in the second year. Similarly, the psychological tests between 3 and 6 months showed twice as high scores as those from 6 months to 18 months. In the earliest period the irritability scores were fairly generally distributed among the different babies, but after 5 months, the *average* amount of ‘fussing’ was somewhat misleading, for a very few babies fussed a great deal and an increasingly large number did not fuss at all. The chief cause of special irritation at the anthropometric examination was probably the greater amount of handling and restraint of the baby and by a stranger especially. The intercorrelations indicate a general tendency for a baby who is irritable at one type of examination to be irritable at other types; in others, ‘irritability’ seems to vary more with the baby than with the situation, some babies being decidedly placid and others irritable, and this tendency seems to be, as Miss Shirley concludes, inborn.

Expressions of pleasure or satisfaction. In spite of Tennyson’s description of the infant as having ‘no language but a cry’ the general impression our children gave in the first few months was one of contentment, and often even of joy and exhilaration, especially in two of the children. Some expressive sounds or actions beginning early are so regular under presumably pleasant conditions, such as at feeding, or after a warm bath, that we may confidently take them to be expressions of satisfaction. Thus:

B, d. 10. From about now (certainly no longer) begin occasional new sounds, grunts of satisfaction apparently, e.g. after a warm bath. Also a sound (once or twice) just like a little laugh. d. 16. Now makes the contented gurgle frequently, not merely after bath or food. d. 21. The contented ‘gurgle’ on being placed by his mother to feed.

Y, d. 29. I heard an eager and pleased ‘ugh, ugh’ as she was put towards the breast after crying with hunger. Distinctly more than hurried breathing. It sounded pleasant, like a low soft laugh.

¹ Op. cit., pp. 24–5. Miss Shirley’s summary on p. 25 does not seem quite consonant with her table and graph.

Precisely similar circumstances marked the first suggestion of a 'chuckle' or crude laugh in A at 7 weeks and in C at 6 weeks.

The further development of laughter and of smiles after about 0;2 is treated in a later chapter: but we will discuss here the first appearance of the smile.

The first smiles and their causes. The smile is certainly among the earliest expressive signs. By d. 17 in A and at least by the end of the first month in B, the 'cooing' or gurgling was sometimes accompanied by a smile (including eye-twinkling). During the first few months the mouth is so often in movement that 'smiles' are often imagined by fond parents at too early a stage. Possibly it was merely such spontaneous movements that I noticed in B on d. 10.

d. 10. B lying on his back looking at his nurse's face (she 'chirruping' like a bird)—an evident large smile at her.

The brightening or twinkling of the eyes coinciding with an apparent smile is the best sign of the genuineness of the smile. I noted this in my boy A on d. 17: 'A very decided smile—he was gazing at my face while I opened my mouth wide to test for imitation.' The same thing happened again on d. 21.

The first unmistakable smile (with twinkling of the eyes) of Y was also in response to a smiling and 'talking' face:

d. 28. Nurse smiled and talked to her and Y gazed at her face. After thirty seconds or so a twinkle of the right eye (almost a wink) and raising of the right side of the mouth—the germ of a smile.

If, however, we can trust the observation of smiles combined with the brightening of the eyes, then they seem to be associated first with feeding. Thus M. G. Blanton noted a spontaneous smile on d. 4 after feeding, and in another infant on d. 7 after bottle-feeding.¹

Dearborn noted a spontaneous smile when his daughter was half asleep nursing as early as d. 7, but there is no reference to observation of eye brightening. Dearborn also makes other early reference to smiles associated with feeding: and I think he is probably right, though at this age the face is so constantly in motion that it is difficult to be sure. He writes: 'Some observers and writers have apparently wrongfully disregarded these lesser reactions, but if not smiles, what are they? Preyer's point of view seems unphysiologic. A baby is not less a baby for being small, despite the well-known argument in court. May we not argue, therefore, that a little smile is none the less a smile?'²

¹ Op. cit., p. 463.

² *Moto-Sensory Development*, p. 5 (Baltimore, 1910). B. Perez also reports that he had seen smiles in many infants before 0;1. See *Les Trois Premières Années de l'Infant*, p. 14 (Paris, 1888).

Nevertheless, the eye-brightening (with the contraction of the muscles round the eye) seems to me the only sure sign of a smile at this early stage; and my own observations suggest that the first *certain* smiles are in response to a human face—usually a smiling, talking face. Mrs. Moore's earliest record refers to d. 6—'smiled when comfortable' and says that (about the fifth week) smiles often occurred when her child was fed and comfortable and dropping asleep, and occasionally he smiled at persons.¹ D. R. Major noted broad smiles on d. 25 when the child was being played with—but was not the person playing with the child also smiling at him?²

Charlotte Bühler's observations led her to the view that smiling at the beginning is exclusively a social function—caused by the glance or voice of human beings, and beginning in the second month, but she also refers to an earlier expression of comfort with 'glowing eyes and mouth lifted at the corners'.³ Preyer first noted a certain smile when on d. 26 his child was lying contented after a good feed.⁴ Darwin first noted smiles from d. 45 'usually when the child was looking at his mother',⁵ and T. Ischikawa noted in his infant definite smiles, usually in response to another face, from d. 44 when the child also 'began to make characteristic noises to express its feeling of well being'.⁶

By 8 weeks Y is noted as being found smiling at me as I talked to M, and not merely in response to my smile; it was a new, more spontaneous type of smile. By 10 weeks B certainly smiled at times when played with or spoken to.

Summing up the evidence of all these earliest observations, we may say that the first certain smiles are either expressive of comfort and pleasant sensations, or they are responsive to a smiling face. (Precisely the same conditions are the first causes of laughter, which will be fully discussed in a later chapter.)

It may be difficult to decide which of these two situations is the first to cause a smile. The interesting thing is that the same expression may appear about the same time in response to two different situations. And it is surely remarkable that the infant's delight in human society should appear so early, running at least a close second to the satisfaction due to food and bodily comfort.

Delight in human companionship. After the 1st month the

¹ *The Mental Development of the Child*, p. 41. (Psychological Review Monograph Supplements, No. 3, 1906).

² *First Steps in Mental Growth*, p. 78 (New York, 1906).

³ *The First Year of Life*, pp. 62-3 (New York, 1930).

⁴ *The Senses and the Will*, p. 296 (New York, 1909).

⁵ 'A Biographical Sketch of an Infant', *Mind*, Vol. II, p. 288.

⁶ *Beobachtungen über die geistige Entwicklung eines Kindes in seinem ersten Lebensjahre*, p. 22 (Langensalza, 1910). Dr. Ischikawa was a mental specialist in Tokio.

evidence for interest in and attraction towards human beings rapidly increased: the selective and concentrated attention on the faces not only of mother and father but of all around, the ready response to smile or laughter, the turning about to seek for a face, which is stared at when found, the spontaneous smiling (at the end of the 2nd month) on seeing a face, the cooing in response to cooing (early in the 2nd month), the exuberant delight at merely being talked to and smiled at in the 3rd month, all suggest how fundamental is the attraction of the baby towards persons around him, and how early appear these signs of interest and delight which form no doubt one of the bases of later affection for others. Several other observers have been impressed by the strength of this attraction, including Miss Shinn, S. V. Dearborn and Charlotte Bühler. Greatly strengthened as it soon must be, by the constant attentions that the child receives, it nevertheless seems much more understandable on the assumption of an innate basis, than as the result merely of the association of satisfaction with the sight of a human face or voice. And this is supported by the fact that according to his mother's report, B, at least by 5 months, showed great delight at the sight of another baby (of 0; 6) and here there could hardly be any association of satisfaction of wants. Charlotte Bühler also reports the smiling at other children at 5 months.¹ After 6 months we get still further evidence, which will be discussed more fully under 'Sympathy and affection' in Chapter XVI.

Variety of expressions and causes of satisfaction or pleasure. By the 5th month a great variety of apparent expressions of pleasure had been noted including not only 'cooing' and smiles but rapid jerking of the arms and kicking of the legs, toes opening and closing (while feeling), smacking of the lips after nursing, laughter and high shrieks, and probably the specially wide opening of the eyes with which it was noted at 7 weeks that B usually began feeding, an expression which Dearborn also interprets as a sign of satisfaction at 0; 2½. B at 0; 2½, 'when feeding at the breast produced much "talking" and smiles and he would sometimes "talk" to a pleasant object—a sound more like the beginning of speech than the cooing sound'.

Y at 0; 2½ uttered loud squeals amidst smiles when I merely talked and laughed to her, and in the 3rd and 4th months B often seemed to shout from mere exuberance of animal spirits. At 0; 4½ playing with his mother's hair was accompanied by high squeals, and at 0; 5, when I let him hit the keyboard of the piano, there were cries of joy at nearly every note.

Causes of pleasure. Bodily comfort, food, the company of mother and father and play with them are, of course, the main causes

¹ *The First Year of Life*, pp. 55-6.

of delight in the first three or four months ; but interest in material things begins in these earliest months too, and there are also signs of great pleasure in certain sensory impressions.

When we come to the satisfaction derived from the looking at *objects* we cannot draw a clear line between interest and apparent curiosity with little sign of feeling or real delight. The beginnings of concentrated attention we shall study elsewhere, but the delight in bright shining objects and, later on, in colours, is mentioned appropriately here. I noted as early as

d. 24 B simply fascinated by the black shining piano the last few days. To-day he kept his eyes fixed on it, even when I turned him round so that he could only just see it by straining his neck round.

Delight in colour. This prolonged gazing is suggestive of new interest, but at this stage one cannot say whether there is any *delight* in the experience ; nor were there many signs of keen pleasure in the prolonged series of experiments with coloured wools done on B from 0 ; 3 to 0 ; 4, though there were a number of occasions when he gazed as long as 1½ minutes at one colour. Just before 0 ; 5, however, I noted that B showed lively pleasure at the sight of a yellow pencil. Also

At 0 ; 5 signs of great pleasure at a bunch of red roses—smiles and look of great interest and excitement such as I do not think I have ever seen on his face before when looking at an object.

Major reports that at 0 ; 3 to 0 ; 4 his child would sometimes, when gazing at a brightly coloured object, throw his arms up and down and kick rapidly.¹

Changeability of feelings. I have already remarked on the apparent intensity of joy experienced in these early months, culminating in B in a period about 0 ; 6 when he was very merry, cooing and shouting most of the time when awake. But more remarkable was the extraordinary rapidity with which, to judge by expressions, feelings could change from pleasant to unpleasant.

Under the heading of inhibition we have already mentioned how even violent crying could sometimes be stopped in the 1st and 2nd months by such simple expedients as rubbing the head or the playing of a chord on the piano ; and at least as late as 0 ; 3½ it was noted that alternating crying and chortling were both stopped by piano-playing.

With increasing age this almost mechanical sudden stopping was replaced by a more gradual change in which feelings seem to conflict. Thus

¹ Op. cit., p. 79.

Y, 0;3. When she was crying I talked to her—smiles came for an instant, then a cry, then smiles again, interrupted by a squaring of the lips.

B, 0;3½. If he has been crying, the chuckles when one approaches are often interspersed with little cries; he often chuckles in the midst of crying.

Several notes at 0;4 remark on the extraordinary rapidity with which the chuckles at anticipation of food alternate with cries. The smiles in responses to smiles themselves at this period are 'evanescent'. Quick smiles in response to mine seem expressive when growing but vanish very quickly and do not, like those of adults, remain expressive when half gone: there is no 'after-glow'.

On the other hand, the smile is sometimes slow in coming. Thus at 0;4½: 'Responsive smile is sometimes very slow in coming: he may gaze 10 to 20 seconds at my smiling face before responding.'

The rapid alternation of expressions of feeling becomes rarer as the child gets older; but I noted that Y, at 1;1, when in a fit of anger suddenly changed to a laugh when she saw me laugh at her: and so a second time. As late as 2;4 this appearance of laughter in the midst of tears was observed in Y. But then laughter is perhaps peculiar in being able to break into the midst of various emotions, especially in response to the suggestive laughter of others.

This quick alternation of feelings might have been taken as a sign of a lack of marked differentiation of feeling at this early age—but it cannot, for it is noticeable at times even in adults.

A curious thing was noted in at least four of my children about the 4th month. There would be sometimes a smile and then a sudden sharp turning away of the head. Even at 0;5 I wrote of X, 'Holds her head steady when gazing at me for a moment, and then comes a smile accompanied apparently by emotional excitement, which results in the dropping of the head.' I recently watched carefully Mrs. J's baby of 0;4, and noted that when she smiled at her mother who had just appeared, she gave a little wriggle of the head to the side (she was lying in her cot).

Probably such reactions are due to excitement resulting in momentary loss of control of voluntary muscles of the neck or a spread of muscular stimulation; or perhaps too, an opportunity for the old spontaneous activity to break in occurs under a condition of mild excitement. But we may ask, is it interpretable as coyness? It may at least be one origin of an instinctive movement which is appearing already at this stage. Thus at 0;4½, while being held in M's arms B would look at me, smile, at once turn his head right away and then look again at me, smile, turn

away again, and so on. At 0; 4½ I noted that he turned coyly also from his mother's face, but this was rarely noticed.

Later individual differences in the expression of feelings. The more placid nature of A as compared with B in the first 3 or 4 months has already been mentioned. This distinction referred not only to signs of displeasure but to signs of pleasure, and it continued to be true of A and B until adolescence—B giving more boisterous signs of exuberant feeling of pleasure and displeasure. Thus B round about 0; 6 would often cry hard on being left alone in cot, though it was light: he wanted company apparently and was quiet when I went to him. A hardly ever cried thus when put to bed at night. Yet B was also the more noisy in his expressions of joy. This distinction ceased after adolescence.

A similar contrast can be drawn between B and Y at the age of 6 months, Y's records indicating that she was also more placid than B—as regards both joy and temper, less easily startled by noises and exceptionally contented. Thus at 0; 6½, 'I took a coloured pencil from her several times; there was not even a whimper until the sixth time.' This kind of deprivation began to be resented by B at 0; 5.

Also there were no indications in Y of any periods of boisterous joy about this time similar to two periods of B's to be described shortly.

Expression and causes of feelings and emotions after age of 6 months.

As we have seen, there are varied signs of satisfaction and dissatisfaction before the age of 6 months, and before then some other expressions seem to become more definitely attached to specific feelings. Thus frowning was noted more definitely in B at about 0; 3 at times when he was apparently mystified but not displeased. Mrs. Moore also noted the frown at 0; 4½ accompanying great effort.

The expressions of feeling become more specific as the child grows older, the general body reactions lessening and others becoming more definite and suggestive of specific emotions such as anger, fear and the feelings accompanying self-assertion or sympathy to be dealt with later.

As to B, in this second half of the first year the most notable fact was the continuance of high spirits, with some fluctuations. These fluctuations were possibly due to physical conditions unknown to us.

Some later notes on several of the children show what is indeed a familiar fact, that physical troubles—e.g. teething—result in the lowering of spirits and the slowing up of learning progress.

Miss Shinn's detailed record, however, of her niece's moods during the first two years led her to conclude that while some

of them could be assigned to physical causes, others could not.¹ That was also our impression of our own children, and these periods of heightened or lowered gaiety sometimes extend over several weeks (with some short period fluctuations within the period). B's 7th month, for example, produced at the beginning of the month this note:

d. 195. The last two days especially he has been merry, cooing and shouting most of the time when awake and not needing toys to amuse him: he needed only to be laid on his back and allowed to kick and roll.

Then come several similar notes at intervals till towards the end of the month: 'The gaiety of the past month continues: his grandfather (staying with us at the time) reticent as he is with compliments, said B was the happiest child he had ever seen.'

Quite independently of this it was noted on d. 203 that he had progressed enormously during the last two weeks or so in rolling about and almost crawling. Fluctuations in learning and periods of special brightness will be referred to in a later chapter: but I may state here our general impression that they tended to accompany the periods of special joyfulness. Yet the matter is not a simple close correlation. Ripening activities suggest new ends which may be unattainable at first. Thus

Y, 0; 10½. Suddenly learned to crawl—seemed to make enormous advances in one day—after many days of effort. Worse tempered this last week or two, M says, so eager to *do* things and yaps if she cannot. First day she crawled she cried as she was crawling, as though annoyed at not going fast enough.

Other kinds of moods also had their special periods; thus I noted of

B, 1; 0. B's temper seems to have developed greatly the last two or three weeks: we have both noticed it: sometimes he screams violently simply for being held a moment to be dressed or if he cannot reach a thing. Y at 1; 0½ also showed marked development of temper and a similar period occurred at 2; 6½.

Increasing differentiation. Before the end of the first year, however, there are differentiated signs of various feelings and emotions and attitudes and we shall turn to them for more specific study directly.

In concluding this chapter, however, attention should be called to the fact that, broadly speaking, the development of expressions of feeling follows the same line as those noted in connexion with spontaneous movements and reflexes. Just as the general hap-

¹ *Notes, &c.*, Vol. I, pp. 246-7.

hazard spontaneous movements of the whole body become more and more differentiated into special controlled movements of individual parts following definite lines, and as *general* bodily reflex responses become somewhat lessened as specific reflexes appear, so the general cry or start, or wriggling-away response of the infant, becomes differentiated into specific types of cries, and expressions of more specific feelings and emotions—of anger and aggression, fear and flight, and so forth. To use one of Herbert Spencer's favourite sayings, homogeneity gives way to heterogeneity.

There are suggestions, however, that even by the end of the first year, some expressions have not yet taken on their adult significance. As late as 1;3 I had a good demonstration of this difficulty of interpreting facial expressions. B was given half a lemon: he bit it and a horrid grimace followed. I expected cries: instead he smacked his lips for more. The grimace was repeated—again eager smacking of the lips; and so three times. At 1;4 with a eucalyptus lozenge, there was a similar procedure. Of course, in an adult there may be a momentary reflex wry face when taking a bite of lemon, and yet on the whole it is enjoyed, but the expression on B's face was much worse than this: and the adult's return to the lemon is partly rational—because he knows it is refreshing.

CHAPTER VIII

Reflexes : Their Development, Variability and Evanescence and their Relation to Voluntary Movements and Instincts¹

In this chapter we shall study the appearance of a number of actions of the infant which are generally regarded as reflexes, e.g. reflex grasping, the eye-blink, and so forth. We may bear in mind in doing this a widely accepted view of a reflex as an innate immediate response of the nervous system to a specific stimulus, resulting in movement of a mechanical type, without intention or conscious guidance.²

In studying reflexes we find some things suggestive for an understanding of the general nature and growth of mind ; for, as I shall try to show, they are more inextricably mingled with other functions and with the general condition of the individual than is commonly supposed.

Further, the more precise study of the reflexes in infancy, the fixing of the usual age for the first signs of definite stages of development, and the exemplifying of individual differences in such matters, may help towards the earlier and more exact diagnosis of mental capacity and defect, and to more reliable prophecies of further probable development, based on the first few months of life. We shall see that in some cases, e.g. the finger grasp, reflexes eventually fade out, giving way to acquired voluntary movements : and this date of disappearance may prove as indicative of the progress of development as do first appearances. Thus it has been noted that grasping or hugging with the arm, called Moro's reflex, which has usually disappeared by about the age of 6 months, was still found in an idiot of 5 years.³

If, however, the appearances of reflexes are to be used as estimates

¹ This chapter is more technical and specialized than those which follow, more concerned with the minutiae of reflexes, and less with general psychological principles. Readers who prefer to defer the reading of it till later could pass on to the succeeding chapters after reading the last section on 'reflexes and instincts' and the 'summary' at the end of the chapter. I have also brought out general points of interest by the use of italics in the text.

² The term 'Reflex' now usually covers also glandular responses such as the flow of saliva in response to salt in the mouth. We shall not discuss this type.

³ E. Dewey, *op. cit.*, p. III.

of development, we cannot rest content with the cross-section method of study in which a group of infants at a given age are tested. This method of course is essential if we are to make wide generalizations. But it cannot, at this stage, replace the daily, almost hourly, observation and repeated testing over a continuous period of months, of the same child in normal home surroundings. For as we shall see, even the reflexes which might be thought the most stable of phenomena are, in some cases at least, so variable, so dependent on general conditions, that a brief examination of a child, unsupported by further observations under varying conditions, may be misleading.

One of the purposes of this chapter in addition to recording observed facts and experimental results, will be to illustrate and emphasize the fact that some of the reflexes come at some stage of mental development into close relation with instinctive and voluntary behaviour. And that the difficulty of deciding when and how far emotional and voluntary influences enter makes it exceedingly difficult, at least at some stages of development, to decide what are in fact purely or mainly reflex or instinctive or voluntary action—so intact and so complex a mechanism is man—even if in definition we can distinguish these concepts clearly.¹

In addition, this chapter will supply psychological evidence of one of the main theses of Sherrington's great work *The Integrative Action of the Nervous System*, namely, that 'a simple reflex is probably a purely abstract conception because all parts of the nervous system are connected together, and no part of it is probably ever capable of reaction without affecting and being affected by various other parts, and it is a system certainly never absolutely at rest'.² Of course such complexity is greatly lessened in animals by the absence of the cortex, the influence of which, especially in inhibiting reflexes, we shall consider later. Yet even in the decapitated frog, if the right thigh is irritated with acid and the right foot held, the normal scratch reflex of the right foot may be transferred to the left foot.³

For the sake of continuity with the last chapter but one it will

¹ In this book I use the term 'instinct' in much the same way that Stout and McDougall do, though I never felt convinced by the latter's insistence that emotion always accompanied instinctive tendencies, and I regard them as more specific and itemized than he did. Towards the end of this chapter the nature of instinct is more precisely discussed in contrast with reflexes. If the reader thinks the term instinct should be confined to the more fixed, unlearned activities of animals, let him translate the term into 'innate propensities'—McDougall's later term. The subject is comprehensively treated in J. Drever's *Instinct in Man*. For a recent defence of term in reference to human beings, see C. Burt, 'Is the Doctrine of Instincts Dead?', *Brit. Jour. of Educational Psych.*, Vol. XI, Nov. 1941.

² Op. cit., pp. 7 and 8.

³ See Starling, *Human Physiology*, p. 606 (11th ed., London, 1905).

be convenient to take first the grasping reflex and the development of voluntary movement.

The finger-grasp reflex. Here again we find considerable individual differences reported even within the first few days. Dearborn noted it in his daughter on d. 1, 'strong and quick', and found it 'notably less vigorous' on the 10th day. Preyer mentions a marked difference between his two children, and my own boy A's finger-grasp was not nearly so strong on d. 12 as B's at the same period. But some apparent individual differences may be due to varying conditions under which tests are made: thus some reports on B and Y are suggestive of the effect on the reflex of emotional influences. They are, on B:

- d. 1. Grasped my little finger with left hand, but not strongly.
- d. 3. When held on back, preparatory to bath, groped vigorously with hands and arms, as though for something to hold. When his father's head was offered he grasped the hair and tugged vigorously: his hand had to be unclashed.

There was of course no deliberate groping at this stage. There appeared to be simply more vigorous and sustained spontaneous movements than usual under the stimulus of excitement through a vague feeling of insecurity due to suspension in the air.

In the little girl Y the finger-grasp was weak on d. 3 as she lay comfortably on her nurse's knee. When at my request she was held aloft rather insecurely on the nurse's hands the grasp was much stronger, till the arm was stretched fully out, though it would not support the full weight. Of B I noted again on:

- d. 8. Finger grasp not shown to-day.
- d. 10. No grasp of my hair when put to his hands which were groping and feeling about.

These were but two of frequent tests of the kind giving negative results.

d. 20. When B was in his bath, which judging from facial expression invariably caused a combination of pleasure and rather fearsome excitement, the reflex was noted again. While in his bath he had my head presented to his clutching hands. He took a firm grasp of my hair with his right hand—quite painful. I raised my head slowly, but he held on, being raised almost out of the bath (with some support from nurse). Then his hold gave way and he dropped a little with a very short, sharp cry.

M. G. Blanton also found that the reflex was 'hard to elicit from a quiet baby, very easy from a crying one'. One baby of 5 weeks 'dying of malnutrition lifted his entire weight and only relaxed on being laid down on a solid support'.¹

¹ 'The Behaviour of the Human Infant during the First Thirty Days of Life', *Psych. Rev.*, Vol. 24, 1917, p. 466.

It would be useful if a sensitive dynamometer could be made suitable for testing the strength of a baby's hand grasp. The difficulty is to get something thin enough for the tiny fingers to enclose. With Y I endeavoured to do this by attaching a round pencil with wire to the hook of the nurse's sensitive spring balance made for the purpose of weighing babies. Two observations I made with this on Y are germane to our present topic.

d. 25. Took the opportunity given by nurse cleaning Y's nose (to wake her when she fell asleep too soon in feeding) to test finger-grasp with balance. Got the handle with difficulty into her left hand—very gentle grip: thumb went round very readily (boy's grip). When nurse inserted cotton wad in nostril, grip greatly increased and registered 2 lb. pressure. Then I tried right-hand grasp; even slacker at start and thumb would not be placed in 'opposed position'. Insertion of wad in nose led to greatly increased grip, 1 lb. registered before it lapsed. I did my utmost to see that the dynamometer was affected only by finger-grasp and not by hand pushing. Of course arm-pull may be one factor, but if it is communicated *through* the finger-grasp that does not matter.

The finger-grasp in sleep. The finger-grasp was shown in sleep by B on d. 12, but not by A; and it was absent when Y was tested several times during sleep in the first few weeks. Gesell mentions the absence of the reflex in new-born infants during sleep. But that it may *continue* during sleep, having started before, is shown in observations on Y. Thus:

d. 16. With a view to testing the length of the finger-grasp and any fluctuations perceptible to touch, I inserted my little finger carefully in Y's left hand (when she was having an interval in a meal), and on her grasping it I applied a slight pull. Her grasp continued for 35 seconds, including two periods of specially tight grasping, and then the hand was jerked away. The next grasp lasted only 15 seconds, but she was restless for food. On being placed to the breast she grasped my finger readily again and this time the grasp resisted my gentle pull *for 7 minutes* without a break though there were slight variations of pressure. At 5 minutes her eyes closed and sucking ceased and she apparently slept, but the grasp continued.

d. 18. Finger-grasp of 10 minutes this morning: (I think this was left hand). Steadier than d. 16, firm all the time with occasional tightenings: not rhythmical, but sometimes coincident with a little excited worrying at the nipple as though in half falling asleep she was losing it. Having apparently slept momentarily several times she seemed to go 'right off' at 8 minutes, and at 10 minutes fingers moved about and hand jerked away (not simple relaxing of grasp).

The finger-grasp in right and left hands. By the end of the second month in the case of B the reflex was more established in the right hand but not in the left.

d. 65. He took a very firm grip of my finger with his right hand but only after some time could I get him to do the same with the left, and then it was very lax. Right hand kept hold even when I pulled his hand up and down and sideways. Later on d. 65. Again the right hand grip stronger than the left, and left gives way sooner. The right grips are almost 'proper'; not quite opposition of thumb to fingers but thumb round end of my finger. I noticed that, as he lay in cot, he was holding his right hand with thumb clenched outside—'boy's grip', but with left hand thumb inside fingers—'girl's grip'—a hint of an earlier change in the right hand to voluntary grasping.¹ d. 66. Both hands 'boy's grip'—later boy's grip in right, 'girl's grip' in left.

With Y, d. 13, the right-hand grasp seemed definitely stronger. On d. 23. 'Y in bath. Right hand took my finger but I could hardly insert my finger in left hand.'

The tables given by J. B. Watson show that *on the average*, among a group of about 100 children, there is little difference between the reflex grasps of the right and left hands respectively.² But this is quite consistent with marked differences between the hands in individual cases. It will be seen later that the superiority of the right-hand reflex grasp in B was followed by precocity of the right hand, as compared with the left, in voluntary grasping.

The transition from reflex to purposive or voluntary grasping. In the reflex proper there is no consciousness of an end to be achieved; the sensations of a sneeze do not guide our manipulation of the mechanisms which produce it. There is a higher type of movement, however, which is 'guided by and adjusted to complex and variable combinations of different sense impressions'.³ This type of movement requires the careful attention of the individual, so that he may adjust his movements till the end is achieved. The child having failed to grasp a pencil reaches out again; failing with the left hand, he tries the right; he varies his efforts till successful. This briefly indicates the new kind of movement I refer to as 'purposive' or 'voluntary'. About B's 10th week, signs appear of deliberate purposive movement of fingers and hand, but it is difficult to distinguish the finger-grasp reflex from voluntary movement. Thus,

¹ The thumb opposition of B at this stage (10th week) seems fairly represented by the photos labelled Pivoted Adduction in the article on 'The Development of Thumb Opposition in the Human Infant', by Arnold Gesell and H. M. Halverson. *Jour. of Genetic Psych.*, June, 1936, Vol. 48, p. 350.

² *Psychology from the Standpoint of a Behaviorist*, 2nd Ed., p. 261.

³ G. F. Stout, *Manual of Psychology*, revised by C. A. Mace, 5th ed., p. 335. Nearly the whole of this section of Stout's on the distinction between reflex action and instinctive, intelligent action bears on this difference.

d. 71: He often holds his two fists together nowadays, and less often bangs himself in the face. Once or twice in this last (9th or 10th) week we have seen him 'rub' an eye, and we hear him scratching his eiderdown in the night, apparently by opening and shutting of hand. For some time he has grasped his mother's blouse, e.g. when being bathed, but this is possibly reflex.

Miss Shinn noted in the 9th week that 'the primitive reflex clasping became longer and more attentive, a development in the direction of grasping'. (In view of my observations on Y, however, e.g. d. 15, it is impossible to regard the *length* of the grasp as indicative of voluntary grasping.) Yet B, d. 75, still shows the reflex grasp in sleep.

Hand-grasp reflex occurs in sleep: though touching on knuckles does not open hand. d. 78. Shows no desire to take hold of small silver vase. Even the reflex grasp is slow to-day. d. 80. Right fist grip is 'boy's', left 'girl's' again—again a hint of earlier development of right hand. d. 81. Stroked and grasped at M's hand again while feeding. d. 83. Carries his dress up to his eyes with both hands and gazes at it (shown by marked convergence of eyes). Once got it quite close up to his left eye and held it there till he cried.

This period of transition to voluntary grasping coincides, as we saw in the last chapter, with the period of movement in general of the hand; and of an *interest in watching the hand*.

A photo taken before the end of the 10th week shows the right hand bringing a silver rattle close up to the mouth with sight concentrated on the rattle, while the left hand with arm extended grasps his dress. The note on the photo shows my interpretation at the time: 'Beginnings of voluntary movement with right hand, reflex grasp with the left.' Several observations suggest this later development of voluntary movement of the left hand corresponding to its inferior reflex powers: e.g. d. 96: 'Pencil put in right hand was taken to the mouth almost at once (three times); when put in left was dropped after a few seconds (twice).'

A similar performance was noted in the case of

Y, d. 91. Again fixating left fist, repeatedly over period of several minutes: when it was moved away (not so jerkily as of yore), it was *steadily* moved up again and gazed at for perhaps 15 to 20 seconds. Meanwhile right hand was grasping dress—in a reflex way.

During this period of the beginnings of voluntary movement the influence of the reflex seems to remain especially as a response to touch sensations in stimulating the hand-grip. The earliest voluntary grasping seems to require the accidental touching of the object. The sight of it is not sufficient.

B, d. 90. No attempts to grasp object (yellow pencil) held up to him though he looks at it. Touch on knuckles opens right hand. d. 92.

Looks interestedly at rattle but does not grasp it till it touches his hand ; still looked at it when grasped.

The child W,¹ d. 65, when a brightly coloured celluloid rattle was held up before her, concentrated her attention on it but made no effort to reach out and grasp it. When the rattle was placed touching her right hand she grasped it and waved it about. Miss Shinn also noted in the 12th week that a touch on the back of the hand suggested grasping. Several notes on B at this time suggest that the voluntary movement of the *arms* combines with a reflex grasp of the *hand* on touching an object, to effect what to superficial observation may look like a volitional movement throughout.

One note suggests that the touch may stimulate movement of hands and not merely grasping. Thus

A, d. 146. Often when pencil held in front of him there is no movement of the hands. Then a touch on hand (though he is not looking at it) at once stimulates movement of the hands, and the pencil is grasped.

The hands naturally, in the course of voluntary or of spontaneous jerky movements, frequently come into contact and they now begin to grasp one another. Thus

B, d. 95. Feels his hands and fingers now with his thumb and finger opposed, e.g. taking right finger between thumb and first finger of left hand.

We see, then, that by about 0 ; 3 *the reflex hand grasp begins to co-operate with the voluntary movements of the arm*—just themselves developing as spontaneous movements decline ; but this co-operation is at first very clumsy and precarious. Indeed, at times there may be an interference by a reflex grasp with voluntary movement. Thus

d. 95. I held silver rattle before his eyes. He was grasping left hand with right and merely gazed at rattle till I held left hand down : then right hand groped about till it touched mine and then moved to rattle and up to mouth.

The development of the power of inhibiting such merely reflex grasping (useless for the purpose of the moment) is evidently one condition of the advancement of voluntary activity. The possibility of interference of a reflex in voluntary movement is shown still more clearly in notes on Y.

d. 130. Red pencil held in front of her, just in reach. Left hand moved and took hold of it at once. Same repeated : this time her hand

¹ The child W is the daughter of my former student, Mr. H. P. Williamson, who, guided by my notes, kindly made careful observations on her from the age of 0 ; 2.

caught on to my hand and tightened on it, though gaze continued on pencil. But she failed to loose my hand and carry hand to pencil. So again, later. Reflex apparently still working inevitably and not within control.

d. 132. Pencil held in front of eyes: both hands moved up towards it: missed it and clasped one another: clung thus for a time; a grunt and impatient movement of locked hands suggestive of impotence or annoyance. (Later left hand succeeded in grasping pencil but let it fall at once: right hand succeeded and held.) Again reflex interfering.

Confirmatory observations were made by my collaborator Mr. Williamson on the child W about the same period. In the early stages it was frequently observed that the *reflex grasp interfered with the voluntary grasping*. Thus

W, 0; 2½. Sometimes clasped hand (reflex) prevented her clasping rattle as she could not loose it (d. 88). When her hands were at her side, clasping her dress (grasp probably reflex), she was unable to loosen them in order to reach rattle (d. 81). Occasionally in groping for object in front of her, both hands met and clasped one another and difficulty was experienced in loosing them in order to grasp the object (d. 84). By about d. 90 this interference was much less often noted, and by that time the right hand was extended *open* towards object reached for and grasp (boy's grip) was immediate on touching the object on several occasions. After this less skill was observed for a day or two and then very rapid progress was made.

A still clearer case of reflex grasp interfering with voluntary grasping was noted in Y.

d. 168. Voluntary movement clearly hindered to-day by reflex grasp. She was holding ring in right hand and putting it to mouth when a straw mat was put on her chair table. This greatly interested her and she put down her hands to it at once repeatedly (still grasping ring), and occasionally brought hands back to the face with apparent disappointment, hands being put down at once to mat still grasping the ring. After repeated efforts ring finally slipped from her hand, and now mat was immediately grasped and instantaneously carried to the mouth. Left hand had meanwhile part of the time been grasping another ring and afterwards seemed unable to manage to grasp mat alone. More attention seemed to be given to right hand.

Thus we see that at this early stage of developing co-operation, *a reflex may conflict with voluntary movement*, just as we saw that spontaneous movements could at a slightly earlier period, and this period of occasional conflict lasted in Y at least six weeks.

Sight and touch co-ordination. We may also consider this learning process from the point of view of the co-ordination of sight and touch. Sight seems to affect the grasping at first simply by providing a stimulus for groping. Thus

d. 95. I held yellow pencil up. B gazed at it: right hand groped towards mine till it grasped mine, felt resistance of my hand, moved on, grasped pencil and at once carried it to mouth, mouth opening wide long before pencil reached it, mouth and hand acting as one.

Yet touch apparently remains for some time the necessary stimulus for the actual grasping for on d. 97: 'There are no signs of grasping at things seen.' But the child is constantly having practice in gazing at things held and moved about, and even in the act of grasping. Thus

d. 100. Put in cot. Seizes eiderdown edge in both hands, moves them towards one another, then back, sometimes till they touch, gazing steadily at left or right hand. N.B. Still moves the hand he is not looking at. This went on over 5 minutes. d. 101. No attempt to grasp rattle at sight, though he watches grasp when rattle touched.

A suggestion that sight may prompt the groping occurs also on

d. 98. Lying in cot, gazing at pink cover: he takes hold of cover with left hand and moves it to and from face. When it slips out of hand he grabs at it again, eyes still fixed in corner of cover. This may be the beginning of grasping guided by sight.

The difficulty of deciding at what stage the sight prompts hand movement and grasp, is due to the continued spontaneous movements of the hands. Thus on

d. 106. He moved right hand towards pencil, when gazing at it, and grasped it (with thumb opposed). But *this hand moving was going on before* and pencil was in track between extended arm and mouth.

But a note on d. 105 says:

B's grasping is now more deliberate, and more varied in direction. The reflex grasp was a closing *round*: this is also a moving *towards* sometimes: and often he has first to open his hand in order to grasp.¹

¹ The beginnings in the child W of the co-operation of sight with grasping and hand movement afford an interesting comparison. 'On d. 66 she was observed watching the movements of her own hand on several occasions and during a feed she clasped and unclasped her hands several times when holding my finger. During the next few days she spontaneously practised clasping and unclasping her hands on objects which they touched and took an interest in watching the movements of her own hands and arms. On d. 69, when rattle held in front of her for a short time, she reached out with her left hand and after several jerky attempts clasped and held it. By a series of jerky movements she at last brought it to her mouth. This procedure was repeated on three consecutive occasions, the left hand being used twice and the right hand once. On d. 70 no attempt was made even after repeated opportunities to reach out for rattle, although she still watched it with great interest and would grasp it if it was placed touching her hand. On d. 71 she again reached out for and grasped the rattle and from now onwards made steady progress in this direction, the left hand being nearly always used.'

Finally, at 0;3½

d. 107. Felt sure of grasping suggested by vision (if not guided). B was crying for company, hands by side, not groping. I showed him his rattle and at once right hand began to move slowly outwards from body and towards centre line (left also moving a little towards centre), till it touched rattle which he then took and approached to face, put to eyes, then to cheek and then got to mouth.

With this there can be no doubt that we have advanced far beyond the early reflex stage: yet even as late as 0;4½ I noted

d. 141. Often still the touch of an object on hand will start groping movements when sight did not. Incidentally, in the left hand the form of the original grasp (i.e. thumb not opposed to finger) still remains.

This grasping at sight makes a striking landmark in the progress of development, and a convenient test of development at about 0;4 or 0;5.¹

Reflex and voluntary movement. The main impressions I gain from my own observations on this development of voluntary movement and the lapse of the reflex grasp are (a) that it is difficult to say when the reflex ends and voluntary grasping begins, and (b) that the period of learning is long, with a considerable overlapping of the two processes, and (c) there are apparent lapses or regressions. Titchener writes: 'The boy does not keep the baby's reflex, and import consciousness into it; the reflex lapses, giving way to other forms of movement'.² But there is a sense in which the reflex seems to be incorporated in, or at least used in the development of the voluntary grasp. There is *already* 'consciousness in the reflex'. The reflex grasp gives the child the identical kin-aesthetic sensations which he has in voluntary grasping. As in the case of the random impulsive movements which a baby's limbs are constantly making, the reflex grasp provides him with the possibility of getting what Ward calls the 'ideal presentation' of the movement, 'presupposed' by 'the actual realization of such (purposive) movement'.³

If voluntary decision can inhibit some reflexes, and emotional and central nervous conditions accentuate them and even thought

¹ Miss Shinn gives 0;4 as the age at which her niece began to grasp by the guidance of sight. See *Notes, &c.*, Vol. I, p. 314. The same age is given by Charlotte Bühler for her group of six infants of 0;5: *The First Year of Life*, p. 205 (New York, 1930). Gesell says the grasping of a red cube, waved in front of an infant and then put on the table in front of him, is done by less than 20% of infants at 0;4, but by about three-quarters of the children at 0;6 (*Mental Growth of the Pre-school Child*, p. 77 and p. 61).

² *Text Book of Psychology* (1911), II, p. 454.

³ *Psychological Principles*, p. 52.

stimulate them (as in 'mouth watering'), why should not a desire and decision to grasp co-operate with the remnants of a more purely reflex response? We know that a one-time volitional action may become mechanical, done without any rememberable consciousness, in fact become a 'secondary' reflex almost indistinguishable from a 'primary' one in its outward manifestations.

It is true that the attempt to initiate, strengthen, or even attend to some reflexes, is enough sometimes to inhibit them, as Darwin knew when he successfully bet his friends that they could not sneeze if they took snuff. Yet we know that higher cortical processes eventually learn to initiate certain movements which continue also at other times to take place in a purely reflex manner. Thus we can initiate the act of swallowing or winking, which take place sometimes as pure reflexes.

Physiology has not solved this problem, though as Sherrington points out:

It is urgently necessary to physiology to know *how* this control—volitional control—is operative upon reflexes, that is how it intrudes, makes its influence felt, upon the running of the reflex machinery.¹ We may premise that some extension of the same processes as [are] operative in simultaneous combination and in successive combination of reflexes, must be operative in this control. There (in Lectures 5 and 6) we saw reflexes modifying each other, and the more complex reactions being built up from simpler and more restricted ones. Some extension of the same process should, in view of our inferences regarding the nature of the dominance of the brain (Lecture 9), apply here also.

On the psychological side I suggest that we may gain some insight into the process through two facts: first, that a reflex may itself appear in a feeble or evanescent form, as in the feeble hand-grasp reflex, or, as we shall see, the half-blinking of the eye, or the evanescent walking reflex or arm-raising reflex to be described shortly; and second, that the *idea* of a stimulus may become associated with a reflex action and so act as its efficient stimulus. In this way there may grow from a consciousness of the reflex action the anticipatory idea of it.

Eye-movements—reflex or controlled. The detailed diary I have given in Chapter V, p. 64, for the first fortnight, reported that even on the first day B seemed to follow the movement of my hand held about 3 inches from his eyes: and by d. 5 'I felt convinced that he follows with his eyes a short way a candle light about 18 inches from his face—but only horizontally.'

As I mentioned then, several other careful observers were convinced of such early following; though others put it somewhat later. More elaborate experiments on a number of children have

¹ Op. cit., p. 388.

given varying results. W. C. Beasley, after testing 109 white and 142 negro infants from birth to d. 12, found that the majority (Negro 93% and White 61%) showed some kind of following in this period.¹ On the other hand, J. M. McGinnis concluded that consistent following is not shown in this period, but that 'the majority of the movements of the infants' eyes occur in the direction of the movements of the stimulating object, but many eye movements in the opposite direction occur. With increasing age there is a gradual increase in the number of eye movements corresponding in direction with the movements of the stimulating object'.² But even McGinnis states that there is something like adult following by the 6th week. McGinnis, however, only waited a few seconds for fixation to take place—a very important factor. Apart from that, however, my own impression was that there were spontaneous movements which at times would counteract what seemed to be, within the first 2 or 3 weeks, a strong tendency to turn, if not an actual reflex turning towards a light; and certainly before the end of the first month there was an effort to turn the head to see an object. On d. 24 when B was gazing at the black piano I turned him nearly round and he strained his neck round to seek the piano—whichever direction I turned him.

The eye-turning to the light is no doubt not a reflex of a rigid fixed definite type. But neither are some of the others, as we have seen. Indeed, it seems to supply us with an excellent example of an intermediate response, not hard to understand from our own experience. At the time of making these early observations on visual development, I made the following entry in my diary:

I noticed this morning, when lying in bed, that my eyes naturally rested on the window—8.30 a.m. but a dull morning. When I fixated a point some two or three feet from window (either above or below) there was an unpleasant sensation, as though stimulation of periphery was unpleasant while fovea was unstimulated, and there was slight effort required to prevent what seemed a 'natural' return of eyes to light.

In this we see something of the reflex in that there is a stimulus, which apart from voluntary control would cause the movement. In the neonate it may be counteracted at times by spontaneous movements. This is especially true, I think, of movements of the head, but sometimes the reflex wins even here. Thus I noted on d. 35: 'As before eyes remain fixed on an object even when body and head are moved right round.'

This semi-reflex may not ripen in all infants in the first few days; but taking even the later dates, the maturing is early, and

¹ See account by E. Dewey, *op. cit.*, p. 97.

² Quoted fully from McGinnis by E. Dewey, *op. cit.*, p. 99.

voluntary control appears in eye movements probably earlier than in any other. As we have seen, such eye-functioning seems to ripen first in the series of motor controls which moves down from eye and head and neck to hands, body and legs. They may be helped by the very fact that this semi-reflex response is less rigid, less inevitable than some of the reflexes, and less hindered by spontaneous movements. Hence we are prepared to find a correspondingly early stage of control—which even, McGinnis says, shows many characteristics of adult control by about 6 weeks. B, by 7 weeks, was found to follow with his eyes the movement of an electric torch vertically as well as horizontally, and even when busily engaged in feeding!

The evanescence of a reflex : (a) the arm-raising reflex. In the finger-grasp reflex we had an example of a reflex which wanes and ultimately disappears as voluntary movement takes its place.

An even clearer case of an evanescent reflex is the tendency to throw up the arms over the head in response to a loud strange noise or other cause of shock. The first appearances of this response in A, B, and Y are during sleep, my first note on B being :

d. 25. Threw up his arms on being taken up when asleep. M [his mother] says he has often done this. d. 32. Threw up hands over head when asleep to-night, when cot was bumped by door.

So with A.

d. 36. When A asleep M bumped the end of the couch. A's hands shot upwards without his wakening. The same happened in response to a shout.

In Y as early as d. 19, the jerking of the cot as she lay sleeping led to a sudden raising of both hands to the level of the lower jaw—three times, though less decidedly the third time. By d. 40 her mother stated that she had not yet seen this arm-raising when Y was awake, but it was noted on d. 42 in response to a startling noise. Notes of a few weeks later on A and B show the response occurring in waking life.

A, d. 52. I tore a sheet of newspaper : he threw up both his arms with a jerk. I repeated tear, louder if anything. No response, three or four times, except interested watching.

B, d. 66. After chatting with him a quarter of an hour to-night, I made a noise like a hen cackling, and up went his arms half way ; so several times.

It is notable that this response took place both during sleep and waking, and that it may take place, as Dearborn also found (on the 10th day), without the child being wakened by the shock which causes it.

We may regard it as an early but somewhat clumsy defence reaction. Yet it is not invariable. Thus the moving of the cot when Y was asleep caused the arm-jerking response on d. 77 but not on d. 93—there was only a wriggling movement of the arms upward: and a loud noise caused no response at all. At 0;3½ twice when B was falling asleep a touch on the cheek with a cold finger caused the right hand to be thrown up: and a few days later when B was asleep, a touch on the right eyelid caused the whole upper part of the body to jerk up, and both arms shot up: and so when the left eyelid was touched.

Before the end of her third month the child W also showed this arm-raising reflex in response to violent noises, to bumping against the cot when she was asleep, and to being lowered suddenly into her bath. The last record was at 0;3. Somewhat later at 0;4½ B's arms are still 'thrown above the head when sleeping in pram which was accidentally jolted'.

This is the last note of the kind, and before the period of infancy was over this reflex disappeared and we have in it possibly the clearest case of a transient reflex. A similar movement, or at least a partial lifting of both hands sometimes occurs in adults under shock or surprise, but I have never yet seen it in any of my children at later periods.

I cannot find any record by other observers of exactly this arm-throwing reflex in response to sound or shock, except that of Dearborn.¹

In the records of some other observers, though there is no reference to a decided throwing-up-of-arms reflex, there are indications of something like a reflex lifting of the hand to scratch. Preyer refers (d. 14) to the raising of the left arm when the left temple was touched during sleep: at 7 weeks, however, the right hand was raised to the left temple, though the left hand was perfectly free to move.² Pflüger, however, found that with a boy of three, the right arm was raised when the right nostril was tickled during sleep, and the left arm when the left nostril was tickled.³

The responses of B at 0;3½ given above may well be a blend

¹ Mr. W. D. Wall reports that his daughter J showed it on d. 19 when she was feeding and he made a sharp sucking sound.

Since this record was first published, I have seen the account in *The Handbook of Child Psychology* (2nd ed., Clark Univ. Press, 1933) in the article by K. C. Pratt, p. 192, of the clasping reflex noted by Moro. But the reflex I noted above did not involve clasping, though there may have been a slight tendency for the hands to approach one another at the end of the movement. It is interesting to note that Moro's reflex has been noted as late as the 5th and 6th months, especially during sleep. (E. Dewey, *Behaviour Development in Infants*, p. 111.) ² *The Senses and the Will*, p. 220.

³ Quoted by Preyer, op. cit., p. 221.

of the arm-lifting reflex and of a slight tendency to a scratching reflex or at least a defensive movement, shown in a purer form in the observations of Preyer and Pflüger.

A further interesting observation of Pflüger's is worth recalling in view of some of the more recent work on the scratching reflex in dogs.

Pflüger laid both arms of the boy (3 years old), who lay on his back asleep, gently near the body, held the left arm firmly with a light pressure on a pillow placed upon it, and holding a feather in his free hand, tickled the left nostril of the little fellow. Immediately the left arm was moved, but could not be brought to the face. The child then made a grimace, and tried, after repeated tickling on the left, to press the left nostril with the right hand, whereas he had at other times always chosen the hand of the same side, however much and however long he was tickled, until he awoke.¹

(b) *The walking reflex.* There are indications in my notes of a very early but evanescent walking reflex. As early as d. 2 I noted, as to one of my boys

When held, the feet just allowed to touch floor, performs quite regular walking movements : progressive, forward movements, not mere pressure against floor, or lifting up and down. d. 9 : Walking reflex still present, as decided as before.

The movement is something distinctly more than the response pressure of the foot when pressed by the hand. There was a movement upwards and forwards of the foot, which was then rather heavily stamped down.

The tendency seemed so unusual that I checked the observation on another boy, and on d. 11 noted :

Walking reflex very evident, much more so than on 2nd or 3rd day when his nurse tried it ; in fact, it did not then show perceptibly.

I have not recorded the exact days of the first appearance of this reflex in my daughter X but I noted

d. 14. Walking reflex practically gone in X.

A, d. 20. Walking reflex scarcely evident.

In B, however, it remained later.

B, d. 24. Still 'walks', not so well on slippery bath bottom as on knee. But on d. 66, Walking reflex almost gone now ; just extends both legs. d. 112. Great delight at being held up so that feet touch couch : legs move up and down, but not nearly so regularly as in earlier weeks, and with no forward movement.

The child W was not tested for this walking-reflex until d. 76, when 'the reflex was clearly shown, five or six distinct forward

¹ Quoted by Preyer, op. cit., p. 221.

steps being made'. For some weeks it was observed that the reflex was shown on some days but not on others up to 0;3. Then it was not obtained again until 0;4½, though there were tests about twice a week. At 0;4½ it was observed several times but was not quite so pronounced as before.

In no other records have I found so early an appearance noted as those of A, B and X in the first month. Possibly in some cases it was not looked for at the appropriate time; or perhaps we have here an example of individual variations in the very existence of an unstable and evanescent reflex. For example, I noted no sign of it in Y during the first fortnight: she would only press her feet downwards against the floor when held in a standing position. On d. 17 she did take three consecutive steps forward but no more. Also my grandson, D, though tested by his father several times previously, did not show these walking movements till d. 89.

That this early walking-reflex is a fairly common one is indicated by an inquiry, made some time after the above account was published,¹ by L. B. Chaney and M. B. McGraw, who found a 'stepping-reflex' present in the majority of the 125 infants they tested before the end of the 'neo-natal period'.² Yet this very early and only temporary walking-reflex seems to have been missed by such careful observers as Miss Shinn, who says that in her niece there was no sign of any instinct to walk³; the niece may have been one of the exceptions, but Miss Shinn's remark relates to her niece at the age of 0;6. It was not until the 9th month that J. M. Baldwin noted a 'native walking-reflex' in his daughter, and at first this resulted in walking backwards: but at 0;9 this may well have been newly awakened impulses which develop into actual walking.⁴ Preyer quotes Champney's account of his child showing similar movements in his 19th week.⁵ Preyer himself noted it in his own child only in the 41st week. It is not clear, however, from Preyer's account, that this walking impulse, at a period so late as the 10th month, can properly be described as merely reflex. Preyer ceased to practise this walking impulse in his child for two weeks, but found it after that period still present: 'From now onwards standing, supported by one hand, resulted in genuine walking, with weight not entirely supported by another'.

Taken altogether, the facts indicate the presence in many, if not all, infants of a walking reflex, which fades during the first

¹ In a paper on 'Reflexes in Early Childhood, *Brit. Jour. of Medical Psych.*, Vol. VII., 1927.

² See *Bull. Neurol. Inst.*, New York, 1932, Vol. II, pp. 1-56, referred to by E. Dewey, op. cit., p. 300.

³ *Notes, &c.*, Vol. I, p. 334.

⁴ *Mental Development in the Child and the Race*, pp. 78, 79.

⁵ Preyer, *The Senses and the Will*, p. 274.

few weeks with a possible reappearance of activities hardly distinguishable between reflex and voluntary movements, at the period when the infant is ripe for learning to walk.

This evanescent walking reflex seems, then, to be another example of those '*anticipatory phenomena*' discussed in Chapter IV, and possibly involved in the general principle that the preparation of many mechanisms and structures must be begun long before they are necessary for the organism.

The inhibition of reflexes. The term 'inhibition' is variously used by psychologists. It may refer to the stopping of an activity, even a reflex, by volition, or to the repression of an impulse by some 'complex', or even by sentiments and ideals. As, however, for the stopping of an activity by volition we have the word 'control', it would seem advisable to keep the term inhibition for processes beyond conscious control, which would not exclude the unconscious repression of impulses, but would usually refer to inhibitions taking place at a lower level, in which sense it is a familiar term to the physiologist of the nervous system. Thus, during the contraction of the biceps muscles, there is normally an accompanying inhibition of the antagonistic triceps muscle. This is an example of what Sherrington calls 'the law of reciprocal innervation'. Or again, a strong sensation or pain may inhibit a reflex; for example, the scratching reflex of the frog's foot may be inhibited by stimulating the optic lobes of the frog with salt.¹

The influence of the cortex in the inhibition of reflexes is well recognized by physiologists. It was strikingly illustrated by Drs. Head and Riddoch. They found in patients whose spinal cords had been completely severed much more violent and general reflex responses to stimulation in a part of the body below the injury, which they called 'mass reflexes' and which are absent when the normal connexion with the cortex is present.² In the intact and normal person, 'under certain forms of cerebral action, antagonistic muscles can be thrown synchronously into contraction'; for example, under the influence of strychnine 'all skeletal muscles may be reflexly thrown into contraction simultaneously'.³ The influence of alcohol in lessening the inhibition of various impulses apparently by some influence on 'higher centres' is also well known.

One question of interest for us in the study of inhibition will be: At what stage does the cortex of the new-born child appear to take an effective part in reflexes and their inhibition? We have seen that there is some evidence of the first association (of food-getting and position or smell) as early as 3 weeks, and fairly certain

¹ Starling, *op. cit.*, p. 607.

² H. Head and G. Riddoch, *Brain*, XL (1917); G. Riddoch, *Brain*, XL.

³ Sherrington, *op. cit.*, p. 106.

evidence by 4 weeks. We have also seen that in the first days various stimuli cause not only a specific response but a general and sometimes convulsive wriggle of the whole body—reminiscent of the mass-reflexes of the patients with the severed spinal cords. And certainly this general response lessens as the child progresses through the first year.

The notes I made on the movement of the arms strongly suggest that even the fundamental mutual inhibition of opposing muscles (e.g. biceps and triceps) did not take place during the earliest days, and that both sets of muscles were constantly contracted together.

d. 5. There is strong resistance to passive movement both in arm and head, so strong that I fear to force it.

d. 6. The resistance of the arms to passive movement was very strong—though there was very little tension about the arm muscles during sleep.

d. 8. Hands in constant 'jerky' motion, as though both sets of muscles were normally at tension, and then suddenly one set were relaxed: for arms are stiff to resist my movement—when one of these jerks is not occurring.¹

If my surmise is correct it would seem to be a further example of the general principle that as the higher centres which are especially the organs of inhibition are not fully developed in early days, inhibitions dependent upon them do not take place.

After a few weeks, however, this tension disappears.

B, d. 46. His arms seem less at tension now than in early days.

d. 64. His arms are much more lax now—submissive to passive movement; and his active movements are less jerky and more continuous.

By the same day this was also true of A, though on d. 29 his resistance to arm movement was much stronger than in the early days—his hand grip being also stronger at that later period. In both these respects he was later than B—but caught him up by about 7 weeks. (*N.B.*—A showed signs of association of position of food before this date, implying some functioning of the cortex.)

On the other hand, some inhibitions do appear in the first few days. Particularly is this true of crying, which we will consider specifically.

The inhibition of crying. The first cry is described by the physiologists as a reflex. If, however, we stick close to the usual psychologist's definition of a reflex, as an innate immediate response of the nervous system to a specific stimulus, without intention or without even conscious guidance or control of the action, it is doubtful if we can call crying a reflex, at least beyond the first few days. It becomes an expression of certain kinds of unpleasant

¹ This jerkiness was also noted by Mrs. Moore, *op. cit.*, p. 11.

feeling-tone. The transition gives us another example of the difficulty of drawing a clear line in the process of development.

In the first few days strong and sudden stimuli often cause a cry as an immediate response. The fact that it is not an invariable response to the same stimulus does not rule it out of the class of reflexes, as we have seen; nor does the fact that the stimuli may be internal, for example, abdominal pain.

Though crying, however, soon becomes rather an expression of a general condition, it is convenient to consider it also as a reflex for the purpose of noting the process of inhibition at early stages and during the process of transition.

If we accept the classification of crying, at least in the earliest stages, as a reflex and denote every interruption of it, in these early stages, as an inhibition, then every mother is familiar with the possibilities of such 'inhibition' by rocking to and fro, or by the stimulation produced by a warm bath.

In distinction from such general influences, however, which may mean the mere removal of sources of discomfort, my own observations show the effect of quite simple and localized sensations in inhibiting crying under a strong stimulus, in the first few weeks. To guard against mere coincidence the tests were often repeated. But the *manner* of the response is often significant.

d. 4. A stopped his loud crying when I rubbed his nose.

d. 3. B stopped crying twice when watch held near eye: but not on two other occasions. d. 5. As he was lying crying with eyes closed, I took rubber teat, moistened end with drop of milk and held it near his nose, taking great care he should not touch it or me. He quietened at once, opened eyes wide, and made sniffing noises. d. 15. For first time got clear case of inhibition of lusty crying by rubbing forehead. A few minutes after same failed, but rubbing nose succeeded at once.

Y, d. 23. Persistent hunger cry stopped at once when put in bath. So frequently but not invariably. Restless crying stopped for about one minute when lavender water put on upper lip.

Dearborn noted inhibition of crying by stroking the forehead as early as d. 1, but he does not say whether the test was made more than once.¹ On d. 12 he noticed crying stopped by holding a bunch of tuberose near his daughter's face—whether through scent or sight.

Similar tests with rubbing of the forehead were repeated successfully on B on ds. 6, 8 and 10 (twice) and on d. 24. I still vividly remember how very sudden these inhibitions of crying were; so different from the gradual stopping of crying, and the lapsing into lesser and lesser sobs and gasps, observable in an older child when

¹ Op. cit., p. 3. W. D. Wall's child J on d. 1 'stopped lusty crying immediately' when pressed on the shoulder; and so several times.

being comforted. Sherrington, it should be noted, emphasizes the suddenness with which reflexes cease under inhibition as contrasted with the gradual ceasing due to fatigue.¹

By the end of two weeks sounds begin to inhibit crying—though as we shall see in the chapter on Fear, when the infant is quiescent, sounds may at times actually cause crying to begin.

d. 14. Loud and long continued crying suddenly stopped by nurse's 'Brrrrh' sound: this repeated two or three times. I stopped thus a howl when only the first gasp had been started.

d. 16. Crying inhibited by 'Brrrrh' sound, three or four times. Never failed, even when mouth gaping to yell.

On d. 20 crying was stopped at once and for a long period by loud playing of low chords on the piano.

Such inhibitions by various sounds (and not merely by touch) indicate the influence of processes in the cortex, the 'ganglion of the distance receptors,' as Sherrington calls it.²

Repeated crying by A during the 7th week was several times stopped even by the quiet ticking of a watch placed to his ear, or by dabbing a drop of scent on his lips.

d. 67. Cries (hunger ?) not stopped by moistening upper lip with water; but 'Lily of the Valley' scent on same place (after drying) produced a big smile and cooing.

It is, of course, inaccurate to use the term 'inhibition' for the results of the mere removal of the cause of crying, as for example by feeding or providing a child with company when it is lonely (e.g. by his mother taking him into bed, though without entertaining him, d. 29); but something more is evident when a strong craving, such as hunger, is inhibited by a new sensation breaking in, as on

d. 46. Inhibition of nursing to-day (for the first time as far as I have seen) by M's brushing his hair—repeated three times. Previously I have tried sounds and rubbing of head but failed to divert attention during nursing.

d. 47. Nursing last night stopped (three times) by flashes of electric torch.

d. 64. Yelled when being dressed (was obviously very hungry) after a train journey. This hungry cry is notable because it can begin so suddenly. Yelling completely stopped for 2 minutes or more by my playing g°-b-d-g' (common chord) and a lower chord. But this ineffective later.

The renewal of crying immediately on removal of the inhibiting stimulus was noted on days 35 and 50.

¹ Op. cit., p. 221.

² There is, however, evidence that reaction to sound may take place below the conscious level.

d. 35. Hungry crying stopped—four times by octave c°-c' loud, and then c°-e-g-c' ; crying again when I desisted.

d. 50. Stopped loud crying (hungry) while I was playing loud bass chords on piano. Crying resumed when I stopped.

McDougall in his *Physiological Psychology* (p. 36) remarked that 'inhibition' seems always to be the result of the simultaneous excitement of some other motor system. As we have seen above, however, sensory stimulation by smell or sound or touch may 'inhibit' crying or feeding without any following *movement* ; and McDougall himself, in his later *Outline*, seems to apply inhibition to the physiological side of such processes as the diversion of attention by the attraction of a more interesting object.¹

When the child enters the third month, processes become so complex that one finds few examples for which the term 'inhibition' is not too simple—unless one is prepared to use it for every interference of any process by any other, as some writers do.² The psychological changes are that the objects are becoming more *meaningful* : they are not a mere stimulus of a given sense : their effect 'spreads'. Thus :

d. 73. When B was lying crying, and I had failed to entertain him, his mother came up to where he could see her (and spoke, I think) and he looked earnestly at her and smiled. [This note is queried as possibly the first recognition of his mother's face.]

No doubt widening of appeal itself is correlated with the taking over by the cortex of control of some of the reflexes which were before relatively independent. A striking or *novel* stimulus, however, will still inhibit crying with the suddenness characteristic of the earlier inhibitions. Thus my imitation of a cock crowing on d. 74 'stopped a loud hunger cry'. Also

d. 82. Quietened by papers being put over his head. When covered with coat, no attempt to remove by means of hand—look of surprise when it was moved.—This was again successful on d. 83. The influence of novelty is further suggested by a note on d. 62.

d. 62. My deep 'mooing' stopped his crying (hungry) *at once* again. It seemed to be losing its power to do so when I left home (a week ago).

With the increasing powers of the infant, any object can now provide many ways of activity, mental and physical, and so can provide variety for attention and for hands. We may look on

¹ See p. 280, and preceding two pages.

² Pavlov, who interprets all human activity as reflexes, either original or conditioned, uses the term inhibition to cover the victory of any one set of responses over another, and he even writes of the 'inhibition of inhibition'. See *Lectures on Conditioned Reflexes*, p. 126 (translated by W. H. Gantt and G. Volborth. London : Allen and Unwin, 1928).

the process of development physiologically as an increasing of the number of incoming paths which can provide an inhibiting stimulus (by the complication of meaning and feeling, with the senses of sight, sound or touch) and by the increasing variety of stimuli which can inhibit—while at the same time there is the elimination, as inhibitors, of a large number of stimuli which have previously been powerful enough to inhibit. At this stage, however, the term 'inhibition' is rarely adequate, though inhibition of the simpler type seems to occur at times when there is a momentary resemblance to the conditions of the more simple reflex arc.

A somewhat pathetic record of B at 1; 0½ indicates the period by which crying was itself brought within the control of volition even when the exciting stimulus was exceptionally strong.

B by 1; 0½ had learned to say 'Ta' in order to obtain things; also when on my knees and crying to be set up, he had frequently stopped crying suddenly and substituted 'Ta'—with instant success. On d. 388 he got unobserved into a room in which the bars of the grate were still hot, though the fire had been raked out, and he badly burned the palm of one hand. After crying violently for a minute or two there was an evident and heroic effort to stop the crying, and in the midst of half stifled sobs he gasped out 'Ta, Ta, Ta' repeatedly. Control of the crying reflex was certainly shown earlier than this, but here it was evinced in spite of probably severe pain.

Such an intervention of the learned 'Ta' surely removes this event from the category of inhibitions in the strict sense.

Development of the Eye-blink Reflex. It may seem strange to speak of the development of a reflex. The essential and invariable marks of a reflex are usually thought to be the fixity and inevitability of its occurrence in response to a definite stimulus; some of our leading psychologists have spoken of its psychological *isolation*, its independence of any complication with other functions of the organism.

The work of Sherrington has shown the difficulty of maintaining such a view. The 'simple reflex', he states, is a 'convenient but artificial abstraction'. The nervous system functions as a whole.¹ Now Sherrington's position was based mainly on experiments with animals; but the study of some of the early appearances of reflexes in the infant impresses one still further with the complication and interdependence of supposed definite reflexes with other functions, and with the possibility of the development of some reflexes, even if one cannot agree with Bechterev's assertion that all reflexes 'may . . . be subject to change resulting from previous conditions'.²

¹ *Integrative Action of the Nervous System*, p. 114.

² *General Principles of Human Reflexology*, p. 138 (London, 1933).

The eye-blinking reflex in response to the rapid approach of an object near the eyes illustrates especially the possibilities of the extension and complication of the sphere of appropriate stimuli of a reflex, without any experimental efforts to produce a 'conditioned' reflex.

Very different dates are given by different observers for the first appearance of this reflex. J. B. Watson says that it 'does not appear until about the 100th day'.¹ A. Gesell puts it down as a test for a normal four-month-old development.² So careful an observer as G. V. N. Dearborn records the reflex as being observed in his daughter for the first time on the 124th day. Miss Shinn noted it on the 56th day; Major on d. 49. We shall see a reason shortly for these divergences.

My first test with my boy B resulted in the record:

d. 10. No blinking reflex when book rapidly approached to within 2 inches of his eyes. Later, same day, however, blowing on the face caused blinking of the eyes, four times. d. 15. Eyes blink when face blown on, but not at sudden approach of hand.

Here the sensation of air blowing on the eye produces the same effect as an actual touch on the eyelid does at the same age. Preyer records that a touch of the lashes produces an immediate closing of the lid during 'the period' of days 5-55. I found with

B, d. 16. Both eyes blink when upper lids are touched, near the centre, but no blink follows when lower lid is touched fairly strongly with the little finger, four times. d. 17. Blinking got by every touch of an eyelash either on upper or lower lids of both eyes (repeated d. 18) but still not with sudden approach of hand. d. 18. When asleep blowing on face caused blinking (i.e. tighter shutting of lids) three or four times without waking. So with Y on d. 16, with A on d. 21, again in B on d. 22, and with no sign of waking.

After this there is in my records no relevant note till d. 64, when I found in B 'no sign of eyelid reflex to rapidly approaching hand, unless a draught is caused'. I test the reflex sometimes by bringing my hand forward edgewise towards B's face, and sometimes broadside on:

So with Y.

d. 63. Approached letter case rapidly sideways to her eyes—no blink. Approached it rapidly broadways, with movement to cause draught of air—blink.

A similar distinction may have existed between head movement and hand. For example,

A, d. 63. The sudden approach of my head towards his eyes caused him to make a big start (throwing up his arms) as well as the eye-wink;

¹ *Psychology from the Standpoint of a Behaviourist*, 2nd ed., p. 253.

² *Mental Growth of the Pre-School Child*, p. 367.

the third time only the eye-wink followed. Yet a hand repeatedly waved quite close to the eyelid did not cause a wink even when he was obviously fixating the hand before its descent.¹

The regular reflex was still not present in B on d. 67, but on

d. 69. The reflex occurred sometimes partial and sometimes complete; no doubt of it, though once or twice it did not happen. I approached hand sideways or with open spread fingers to avoid causing a draught of air. Later in the day I failed to get winking reflex with hand movement, only with head: it is still a question of draught?

Notes on the child W show that on this same day

d. 69. There was the first blink in response to rapid approach of hand sideways; though on d. 64 there was no blink in response to rapid approach of hand edgewise while there was response to full hand or head and to blowing on the face four times in succession.

The extreme instability of the reflex is shown at this period at which it is just ripening; thus:

B, d. 70. Wink reflex this morning with this note book (quarto) but only first time: not repeated two or three times. Yet d. 71, the reflex was obtained, the hand being used with open fingers, five or six times following.

It is difficult, of course, to be certain that such variability is not at least partly due to variation in the strength of the stimulus, e.g. the strength of the air current caused. But I myself was convinced that it was not due merely to this; and some observations seem to make it clear; the last mentioned, for example, when the blink was obtained with fingers open, and the next, when the jovial mood B was in, seemed to affect his reactions:

d. 76. Frequently the winking reflex fails to-day, both with head and hand: he just chuckles and enjoys it when it is the head that is moved towards him. d. 84. Similar failure with half a dozen tests, head and fist. d. 85. There is wink-reflex to-day with head but not with fist. d. 87. Wink-reflex takes place but not always with hand. Sometimes it does first time and then not succeeding three or four times. Yet d. 89, winking reflex four times in succession with head or pointed fist.

Mr. Williamson noted of his daughter W on d. 92: 'Only half blinks noted when she seemed uncomfortable with wind.'

We shall see that the eye-blink in response to sudden sounds shows precisely the same instability. It would seem that reflexes like higher functions (as we shall see later) in the early stages of

¹ It is possible, however, that the former result was due to a greater start or shock produced by a larger object like the head approaching. It may be noted that A's wink-reflex occurred on d. 44, as a result of the banging of a wooden brick on the floor, though this failed to produce it on d. 59.

ripening, may function sometimes, and not at others; and that the general condition and especially the emotional mood of the child can affect the occurrence of the reflex.

These variations in reactions at the same period make the reflex unreliable as a test of development, unless it is repeated under various conditions, and with a standardized stimulus.

A further stage was reached by B on d. 113 when 'blinking reflex occurs now to fairly slow approach of head or hands, a very slow and slight approach causes partial closing of lids'.

W also on d. 101 first blinked (three times) to a slow approach of fist to her face.

By this time the reflex response seems fairly definitely associated with sight as well as touch sensations. No doubt the development of sight is itself an important factor. At these early stages it is possible that, if the reflex is to take place, the child must be looking directly at the object before it approaches his face, though this is not necessary in the adult. At least I noted with

A, d. 66. When he was fixating my face I rapidly approached note book to his eyes: no wink (three times). But when I moved my face away and waited till he fixated the book and approached the book as before, a wink followed each time. Yet previously he did not wink at rapid approach of my face though he seemed to be looking at it. Similarly on d. 77: Winking reflex occurs with cushion when he is looking at it, or almost directly at it. If eyes averted somewhat, reflex does not occur.

Miss Shinn points out that several observers noted the winking reflex about the same time as voluntary accommodation of the eye; and suggests that the reflex may be due to 'the power of following by accommodation the approach of a body toward the eyes, and perceiving with some distinctness its sudden expansion across the field of vision'.¹

The difficulty in accepting this, however, is that the apparent sudden expansion is no greater because of accommodation: while lack of convergence may actually make the expansion appear even greater. Of course accommodation is important for judging distance, but it is hardly likely that anything in the nature of a judgement of changing distances is involved at this early stage. The definite gazing at an object and following it with the eyes appears long before the establishment of the reflex, indeed before the 1st month is over.

It seems to me more probable that a response originally confined to actual touch of the eyes, but occurring also when a movement of air produces a touch sensation, becomes gradually associated with the sight of an approaching object as the approach of an object

¹ More recently, Dr. A. Gesell, who found that between 65% and 84% of the 50 babies tested at 4 months blinked at the approach of a hand, but less than 50% at the sudden approach of a pencil, suggests that the latter represents a somewhat more advanced neuro-ocular organization. See *The Mental Growth of the Pre-School Child*, p. 103.

becomes associated with sensations caused by air movement, the development of accommodation perhaps helping towards a co-ordination by building up delicate sensitivity to variations of distance. In the course of dressing and undressing, being swung in the arms of mother or nurse and so forth, there must be hundreds of occasions in the first few weeks of life in which a baby experiences such touch sensations due to air movements synchronously with the approach of bodies to his eyes.

If such an extension or transference is the mode of development of the reflex then this wink-reflex, in its final form, becomes identical with the so-called 'conditioned reflex'—a not very exact description of the phenomenon, as it seems to me.

It will be seen that, if my surmise is correct, the *manner* of testing the reflex, during the transition period, becomes of great importance.

Another explanation of the development of the eye-blink at approaching objects has been suggested to me—namely that it is connected with the maturing of fear together with the fuller 'meaning' of the approach to the eyes of external objects. As to this I would point out that the eye-blink in response to a loud and startling noise, the first stimulant of (apparent) fear, occurs, as we shall see, as early as the 40th day, or even earlier; while the fuller 'meaning' of the approach of an external object to the eyes is likely to be brought about by nothing but the association of sight with touch, as I have suggested above.

The possibility of the extension of the effective stimulus of a reflex by association is more definitely shown by some later tests on A, B, and Y in reference to the eye-blink in response to loud sounds, which we will now consider.

The eye-blink in response to sounds. The blinking of the eyes when a loud sudden sound occurs is a familiar phenomenon. It seems part of a general reaction to sudden shock. Darwin noted it in his child during the first fortnight in response to a sudden sound. Preyer noted winking at a sudden noise on the 25th day. With Y I noted on d. 42: 'A loud door bang, while she was nursing, produced eye-blink. Tested twice'; and it no doubt occurred frequently in the others in reactions suggesting a shock of some kind, when e.g. the head was thrown back and the body stiffened, without its being noticed among the more marked bodily reactions. As to

Y, d. 61. As she lay on M's knee, resting near end of evening feed, I banged my note-book together *out of her sight*: no blink. Again: a blink followed. Third time: half-blink. Loud bang of door caused *a blink, in midst of contented coos which were not interrupted*, one following immediately on blink.

The last observation is of special interest, for it suggests that

this expressive reaction, sometimes said to be indicative of elementary fear-shock, may occur without feeling being disturbed. This is illustrated more strikingly by the next note.

B, d. 114. I clapped my hands when B was looking at his mother : no blink. When I took her place so that he could see my hands he did blink. (I do not know that they were louder claps.) *He also laughed aloud.* This was repeated several times. If the sudden start and eye-blink was accompanied by something in the nature of start or shock, as is usually supposed, then the quick following of laughter as in the note on B above, shows at least that the shock is very slight, or is suggestive of the close association of exhilaration with a slight fear stimulus.

Later, d. 114. I repeated experiments with claps : several very loud claps, no effect : when I attracted his attention so that he could see my hands (though 3 feet off and hands moving not towards him but at right angles to his line of vision) then again he blinked several times. I find I can get the blink by rapid clapping motion, without the sound, but it is not so decided (often only half-blink) as when there is loud sound.

It is of course difficult to be certain that there are not variations in the loudness of the hand clap in such tests as these. With this danger definitely in mind I re-tested Y on d. 105 as she lay on her mother's knee resting in an interval of feeding.

d. 105.	Hand clap out	Hand clap out of sight
	of sight . . blink	(taking care to make
	Do. . . no blink	it louder). . . . no blink
	Hand clap in	Do. . . . no blink
	sight . . . blink	

Mr. Williamson reports as to

W, d. 73. Blinks occurred every time for about six or eight tests in response to loud hand claps when she was looking at the hands, but only once when hands were out of sight. On d. 92 the following experiments were performed on W :

	Reaction to loud clap when hands in sight			Reactions to clapping motion without noise			
1st expt.	1 —	2 blink	3 blink (interval of $\frac{1}{2}$ min.)	1 —	2 —	3 —	4 —
2nd expt.	blink	blink	blink (no interval)	blink	$\frac{1}{2}$ blink	—	—
3rd expt.	blink	blink	blink („ „)	$\frac{1}{2}$ blink	blink	—	—

d. 110. She blinked each time to claps made in her sight, smiling and cooing after each one : but when claps were made out of sight no blink occurred, although she continued to coo with excitement and pleasure after each successive clap. After this no blinks were observed to claps produced in sight, although she continued to coo.

In view of the great instability of the eye-blink reflex—to be shown later—we cannot entirely rely on these observations on two infants; but they suggest the possibility of a blink-response to seen claps, when claps only heard *or* pretended claps with no sound, were not blinked at. Such a fact would be comprehensible on the assumption that this reflex sometimes works as the result of a *summation of two stimuli* when it may not work in response to one alone. (It is to be remarked that this phenomenon was only noticed at a period when the eye-blink response to an object seen approaching had developed.)

The effectiveness of summation of stimuli is well known to physiologists. Sherrington, for example, states that mechanical and chemical reactions may reinforce one another in a reflex response,¹ and Pavlov asserts that the combination of two weak stimuli give results approximately equal to that of one strong stimulus.² It is interesting to find at this level of mental activity a simple example of a principle which obtains at higher levels, as, for example, in the determination of competing associations, and the effecting of a voluntary decision by two motives when one proves inadequate.

The next record on B is

d. 164, when 'Pretended hand clap produced blinking, three or four times; then did not. Made hand claps where he could not see, and blinks recurred each time. Then claps renewed in his sight and blinks occurred. Now pretended claps produced blinks again two or three times and then failed again; renewed claps in sight, then again pretended ones, produced blinks, but for a shorter time—only once or twice, then failed.'

This tendency remained at least as late as d. 200, the last note when 'he still blinks at a seen clap and at first pretended clap, but not at second or third pretended clap. He still blinks at a clap noise when hands not seen'.

Here again we seem to have definite evidence of a 'conditioned-reflex' in the course of the development in early infancy; the reflex occurs in response to seen movement which has been associated with the sound of a clap—the primary 'appropriate' stimulus. It is comparable to the phenomenon made famous by Pavlov, that when a horn was repeatedly blown at the same time as an acid was placed in the mouth of a dog the increased flow of saliva due to the acid could eventually be obtained by the blowing of the

¹ Op. cit., p. 313.

² *Lectures on Conditioned Reflexes*, p. 387. The phenomena of the summation of stimuli and other aspects of the spinal reflexes are clearly discussed by J. T. MacCurdy in *Common Principles in Psychology and Physiology*, pp. 150-2 (Cambridge Univ. Press, 1928).

horn alone, when it had become associated with the acid.¹ And further, it affords an example of 'co-ordination' by a common path, to use Sherrington's phrase. 'The ramifications', he writes, 'of the central neurones attached to these (distance) receptors are so extensive and the reactions they excite are so far spreading in the organism that their association with the reactions and central mechanisms of other receptors is especially frequent and wide.'²

The instability of a reflex. The variability of the eye-blink reflex in response to sound was so marked, and so great was the difficulty of making certain that it was not due to varying strength of stimuli that I carried out with Y (at about 0;3 and later at 0;6) a long series of experiments with a standardized sound stimulus. This was produced by dropping a stone weighing about 1 lb. on to a small tin tray turned upside down on the floor at a distance of 6 feet from the infant. The stone was dropped at first from a height of 1 foot, which was then raised to 2, then to 3 feet, and finally to 4 feet. The experiments were only done when the child was lying happy and contented on her mother's knee, usually resting in the middle of a meal, or at the end. For the first three days the intervals between the bangs were about 5 to 7 seconds. I then lengthened the intervals to between 15 and 20 seconds, to lessen the chance of fatigue influences.

In the table below the score 1 means a complete blink, $\frac{1}{2}$ means a slight blink but not a complete shutting of the eyes. Any special occurrence is noted below.

This experiment clearly illustrates the extreme instability of the blink reflex at this stage. At one sitting it seemed that the diversion of attention by the face of a visitor might inhibit the reflex: but on nearly all occasions no such variations in surroundings occurred: the reflex, indeed, seemed to appear or not in a most arbitrary fashion. Table I shows more clearly than we have done so far, how cautious we must be in interpreting the absence of a reflex response on one or two given occasions as showing that the requisite mechanism has not yet matured; for example, there was no response to any of the twelve tests in the morning of d. 195, but the reflex revealed itself again in the evening.

Variability of a reflex under varying general conditions. In view of the great instability of the blink-reflex without any apparent variation of external physical conditions to account for it, we are more prepared to find that varying bodily conditions, emotional states, &c. may affect markedly the happening of a reflex. I often observed with B that crying at a strange sound and other 'fear'

¹ Pavlov, *Scientific Investigation of the Psychical Faculties or Processes in Animals*, Huxley Lecture, 1906.

² Op. cit., p. 351.

Table I. Showing Variability of Eye-blink response to loud sound

Day	111	112	114	115	116	117	118	119	120	121	195 a.m.	195 p.m.	196
Length of stone drop (feet)	1	2	3	3	3	3	3	3	3	3	3	4	4
Time intervals (minimum)	5"	5"	5"	15"	15"	15"	15"	15"	15"	15"	15"	15"	15"
Results of tests	1	2	3	1	1	1	1	1	1	1	1	1	1
	2	3	1	1	1	1	1	1	1	1	1	1	1
	3	1	1	1	1	1	1	1	1	1	1	1	1
	4	1	1	1	1	1	1	1	1	1	1	1	1
	5	1	1	1	1	1	1	1	1	1	1	1	1
	6	1	1	1	1	1	1	1	1	1	1	1	1
	7	1	1	1	1	1	1	1	1	1	1	1	1
	8	1	1	1	1	1	1	1	1	1	1	1	1
	9	1	1	1	1	1	1	1	1	1	1	1	1
	10	1	1	1	1	1	1	1	1	1	1	1	1
	11	1	1	1	1	1	1	1	1	1	1	1	1
	12	1	1	1	1	1	1	1	1	1	1	1	1
	13	1	1	1	1	1	1	1	1	1	1	1	1
	14	1	1	1	1	1	1	1	1	1	1	1	1
	15	1	1	1	1	1	1	1	1	1	1	1	1
	16	1	1	1	1	1	1	1	1	1	1	1	1
Totals.	Average	4	8	8	8	8	5½	7½	7	10			
		12	12	12	12	12	12	12	12	12			

N.B.—The mark 1 indicates a complete blink; ½ indicates a partial blink.

a At the same moment as the bang, door opened and M came into the room.

b Had just turned away from looking at me when the 9th bang took place; and at the 11th she was in the act of so turning.

c Y's brother was now within sight and Y interested in gazing at him. This day (117) she was tested when ready for her meal, and at bang No. 12 she was turning towards M making food grunts.

d On d. 118 she was held by her nurse and was gazing all the time at her mother's face.

e Looking smiling at me.

f On d. 120 after No. 1, Y was feeding continuously during the experiment. At every bang, after the 2nd, whether there was a blink or not, she took her face away from the breast and looked up.

g For 6th and following tests Y was placed on bed instead of on mother's knee but it was impossible to place her where she could not see one of us and yet be where her eye-blink could be seen. She was in a most jovial exuberant mood at the time of this test, laughing and crowing. A drop of 5 feet was tried for No. 12 without avail.

h A slight frown occurred: in cases 5 and 12 there was a delay of a fraction of a second.

reactions were less likely to take place when the baby was nursing than at other times. Similarly Miss Shinn noted that the eye-blink, which took place at the ringing of a bell, did not do so when the child was nursing.¹ We have already seen that the hand-grasp reflex was markedly affected in the first weeks by emotional conditions.

In the case of reflexes which are associated with emotional states (for example, blushing, paling and starting), it is not surprising that a special condition of the whole organism may inhibit the emotion normally produced and so the reflex associated with it.

In view of the known central interference or facilitation of reflexes, of the general influence of the cortex on reflexes, both by way of unconscious inhibition and in some cases of the voluntary initiation of an action usually reflex, and of the effect of fatigue on reflexes, one would expect *a priori* that varying conditions of the central nervous system and especially strong instinctive impulses and emotional states would have their influence on the appearance in infancy even of those reflexes not usually considered to be specially related to emotions or instincts.

The neglect of this possibility has led to a failure to interpret aright the variability of some reflexes in individual cases. No doubt individuals vary as to the strength and fixity of certain reflexes, and the relative maturity of the child at birth may have its influence on the date of the appearance of some reflexes. But some differences in the results of tests on different children (as, for example, the hand-grasp reflex and the eye-blink test itself) are almost certainly due to the influences of the general psycho-physical conditions of the children at the moment.

Reflex or instinct : the sucking impulse. It is of special interest to note the evidences at this early stage of the activities which apparently blend reflexes and instincts or involve both.

The process of food getting if carefully studied impresses on one the difficulty of drawing a hard and fast line between reflexes and instinctive actions. Dearborn² refers to sucking as a reflex. Stern calls it an instinct.³ Miss Shinn⁴ after writing—'Sucking, if . . . instinctive, not a reflex' comes down on the side of instinct, partly because it ceases with satisfaction and partly because it can be initiated without external stimulus. She adds that as the child grows older, sucking loses the traits of a reflex that it at first possessed, and becomes purely voluntary.

Preyer⁵ after remarking that 'Intellect' must be excluded from

¹ *Notes on the Development of a Child*, Vol. I, p. 107.

² *Op. cit.*, p. 198.

³ *The Psychology of Early Childhood*, p. 70.

⁴ *Notes on the Development of a Child*, I, p. 386.

⁵ *The Senses and the Will*, p. 258.

the process of sucking, seeing that a child without a cortex sucks, argues that sucking is not a pure reflex, in that a babe sucks only when it is hungry. Similarly Koffka, mentioning among other things this characteristic of an instinct, namely that 'there must be a particular state of the organism as a whole', says that this is true of suckling which he accordingly groups with instincts.¹

My own observations suggest the existence of *an evanescent reflex within an instinctive system*. For observations on the first day (and frequently later) show that B would suck his thumb when he would not suck the breast. During later weeks—as mothers well know—a child will often suck its thumb when replete: but by then it may be argued that sucking has become a habit. The significance of observations on the first day or two is that the reflex seems to occur before a 'habit' based on the instinct could possibly be set up. Thus:

d. 1. 'B sucked his right thumb even though he would not seriously tackle the breast.'—There was practically no feeding on d. 1, yet so frequent sucking of thumb or fist, that I made the note: 'Only right hand sucked so far.'

d. 2. Though on one occasion he 'nursed well' he would not take food properly most of the day, and he was (forcibly) spoon fed several times by the nurse.

Dearborn also mentions that his daughter would not nurse the first day, yet 'suction on the fingers and the side of the fist was very strong and lively from the very first morning'. M. G. Blanton noticed one infant sucking his thumb twenty minutes after birth.² The contention therefore of Preyer that sucking is an instinct because it only takes place when the child is hungry, cannot be upheld. The fact that it takes place so often in sleep is also in favour of its classification as a reflex, as is also the fact that a child without a cortex will suck.

There would seem then to be a reflex in the sense that the placing of an object of suitable shape, temperature and softness in the mouth produces sucking, even when food is not sought or desired. And this reflex is made use of in the wider instinctive process of food getting involving groping also for the breast; and undoubtedly the state of hunger is the usual stimulus at early stages at least of sucking actively. Later on the craving for the reflex activity is intelligently satisfied by placing the thumb intentionally in the mouth—as a craving for the release of the sneezing reflex may be produced by deliberately looking at the sun. This deliberate satisfying of the sucking impulse sometimes seems to

¹ *The Growth of the Mind*, p. 87. Koffka later argues that reflexes are to be explained as instincts, instead of vice versa (p. 108).

² W. D. Wall's J sucked her hand two hours after birth.

establish a habit or species of secondary reflex, which in some children is persistent for several years, and which even shows traces in some adults.

Its continued association with the craving for food even at the later stages of infancy is shown by the fact that a child will pacify itself when hungry by sucking its thumb vigorously. Thus :

B, d. 157. 'Crying, very hungry. Soothes himself for a time with his thumb, and does not take it out at once even when put close to the breast.' Similarly on d. 162.

This child also, about this period, on being lifted in the night for a feed, frequently slipped his thumb into his mouth at once, before waking.

The distinction between reflexes and instincts. It may be thought that many facts in this chapter suggest that there is no clear distinction between a reflex and an instinct. It is far from my purpose to suggest that; and even if we could not draw a definite line of division between reflexes and instinctive actions, the two names would be needed. For in psychology, where all ideas of parts of the whole mind are abstract though convenient conceptions, it is necessary to indicate by separate names actions or qualities which stand out at stages in a continuous series even where no absolute break can be made.

It is, rather, my desire to illustrate some of the grades in the series from a purely mechanical and isolated action—the (theoretically) 'simple reflex' to the highly complex instinctive or purposive actions: to show resemblance between actions usually classified as reflexes and others often called instincts: and to emphasize the fact that reflexes may be linked up with and included in the main activities of instinctive systems.

Supposed marks of a reflex, as contrasted with an instinct. The facts we have been considering in this chapter show at least that some of the criteria offered for distinguishing reflexes from instincts are unsatisfactory, or at least need modifying. Let us consider the chief ones.

(a) First, an instinct is said to be the '*reaction of the whole organism*', while a reflex is always a '*partial reaction*'.¹

Now we know that a reflex is dependent partly on the general conditions of the organism as a whole. It is even used sometimes as a test of general nervous condition. The nature of the reflex response is, at least in a negative sense, determined by the inhibiting effect of the cortex. But further, we have seen reason to believe, as in the case of the hand-grasp reflex, that an emotional state or even mild excitement may cause that reflex to take place when it

¹ E. B. Titchener, *Text Book of Psychology*, II, p. 464; McDougall, *Outline of Psychology*, p. 56.

would not do so otherwise, or it may intensify its strength. In other words, that the general condition of the whole organism may be one factor in *producing* a reflex, just as a more limited facilitation by supplementary sensory stimulations may be one factor, and an essential one as the physiologists have shown.

Further, in the earliest weeks some stimuli (for example, a loud sound) while causing a specific reflex—the eye-blink—cause also a general bodily response. One reflex at least (the Moro) has been described as a ‘total body pattern’ by an experimenter on reflexes.¹

On the other hand, even an instinctive response is hardly a reaction of the *whole* organism in the fullest sense. In flight under fear the instincts of sex and acquisitiveness are in entire abeyance, and the intellectual interests of life—however powerful normally—are entirely inactive. One may defend this idea of a response of the whole organism better by reference to energy, and its concentration on the main end in view. ‘That is the type of the total reaction,’ writes McDougall. ‘The vital energies of the whole organism are concentrated upon the task in hand.’² And even to this I should prefer to add ‘the *main* vital energies’: for who can say whether some special energies are not correlated with the activities and interests which are quiescent at the moment?

An instinct, then, may be said to be a response of the whole organism only (apart from its complication with intelligence, to which I shall refer later) in the sense that no main section of the nervous system is entirely cut off from the more localized parts concerned with the action or from the possibility of influencing that action. And even this may be true of a reflex. Nevertheless, instinctive actions do usually involve more varied activities—in that an intelligent grasp of a situation is involved and feeling or emotion is usually experienced.

(b) A second characteristic of the reflex is said to be the *absence of any ‘profiting by experience’*.³ ‘The whole process is immediate and incapable of modification.’⁴ Now certainly there is no conscious and deliberate changing of response as the result of experience. There is, however, some improvement in the sucking and grasping reflexes; though it is, of course, difficult to say how far this is due merely to ripening and how far to experience. The extension of the winking reflex to things seen approaching is properly a result of *association* of a new stimulus with other appropriate stimuli a

¹ See M. B. McGraw, *Jour. of Genetic Psych.*, March 1933, Vol. 42, p. 212.

² *Outline of Psychology*, p. 57.

³ *Op. cit.*, p. 54.

⁴ W. H. R. Rivers, *Instinct and the Unconscious*, p. 28. Dr. Rivers just afterwards contrasts reflexes with conscious processes, so he may not have intended to include all reflexes under this statement.

'conditioned' reflex; and to the citing of such improvements or extensions the reply may well be made that in so far as there is learning or modification *as the result of consciousness*, there is something more than a reflex involved in the whole process. This, as I understand it, is McDougall's reply when faced with the example of a conditioned reflex shown by Pavlov's dog, when the bell had become associated with food and hence caused saliva to flow.¹

It is, I think, perfectly legitimate to contend that such 'reflexes' are more than reflexes. I am at present simply concerned to point out that some acknowledged reflex processes are either capable of development, or at least of complication in that they become inextricably linked up with higher processes. This sphere may be extended by association—as in the winking reflex and the saliva flow. They may improve with experience, as in the grasping reflex, possibly by mere improved efficiency of the mechanism; and if the improvement is due to maturation, that maturing may itself be stimulated by exercise. In the complication with the beginnings of voluntary movement as in grasping, the whole process involves something more than a reflex, so far as there is guided and modified movement in accordance with a purposed end. Yet in the development of this voluntary movement, there seem to be at least learning *through* reflexes.

Further, reflexes may be linked with instinctive processes as in food-getting and sex, so as to be almost inseparable. We need not then accept either of the two extreme opinions as to the nature of the long series of useful actions such as the Solitary Wasp goes through in providing for the next generation—on the one hand that they are merely a series of reflex actions, and on the other that the whole process is instinctive. For a third view is possible, namely, that the whole process is one in which many genuinely reflex responses are embedded in a wider process, partly guided by consciousness.

(c) A third characteristic of the reflex is said to be its *Inevitability*. We have seen that the occurrence of some reflexes is dependent upon the general condition of the organism, and sometimes perhaps upon the relative novelty of the stimulus, or rather the recency with which the stimulus has been applied. The eye-blink which occurred on the first loud clap of the hands might cease on the third or fourth. A sneeze produced once or twice by looking at the sun, cannot be reproduced a third or fourth time without a considerable interval. If it is replied that this is mere fatigue, then we might say that variability of this type in instinctive process, and even in intelligent interests, may be due sometimes to fatigue. Apart from the influence of fatigue (as when the speeding

¹ McDougall, op. cit., p. 55.

up of the stimuli of the eye-blink results in intermittent misses of the reflex response) we found inexplicable variability in the eye-blink response to sudden noises.

(d) A fourth distinction, namely, that a reflex lacks that '*persistence with varied effort*' characteristic of instinctive actions, seems unquestionable.

There is, of course, the well-known example of the decerebrated frog, who will scratch his left side (irritated by acid) with his left foot: and then if the left foot is held up, will, after a pause, use the right foot. But as the physiologists themselves point out, the continued stimulation would by summation result in an overflow from the left side to the right, and so produce a reflex.¹

(e) A fifth mark of the reflex is said to be the nature of its *dependence on external stimulus*. It 'does not show that preparation for the coming situation' shown by purposive behaviour.² The reflex 'is not prepared for by previous activity'. 'The reflex reaction occurs when the stimulus is applied as a loaded pistol goes off when the trigger is pulled. Until the appropriate stimulus is applied the animal remains passive. On the other hand, the bird gathering materials for its nest . . . *takes the initiative* . . . and goes out to meet coming impressions'.³

This criterion also withstands criticism better. Some stimuli of reflexes, indeed, are within the organism: which brings them nearer to instinctive action proper, from this particular point of view. Admittedly, however, when there is prevision of a result and desire for it—even if it is a desire for the sensation of a reflex as in snuff-taking—there is intelligence and something more than a mere reflex. It may be noted here that the distinction between reflex and intelligent action or deliberate choice is much easier to make than is that between the reflex and that conception of instinct which holds that intelligence is not an essential element in instinctive action. One sentence at least of Stout's, if taken alone might indeed suggest that he could build up his conception of instinct simply by means of reflexes plus intelligence. 'The difference' between reflex action and instinctive conduct, he says, is that 'instinctive conduct does and reflex-action does not presuppose the co-operation of intelligent consciousness, including under this head interest, attention, variation of behaviour according as its results are satisfactory or unsatisfactory, and the power of learning

¹ Starling, *Human Physiology*, 5th ed., p. 606. McDougall even suggests that in an animal at this low stage, the brain (as is the case in some animals at a lower level) may not be essential for consciousness, and the frog's action may be conscious and 'purposive'. Op. cit., p. 55.

² McDougall, op. cit., p. 54.

³ Stout, *Manual of Psychology*, p. 336 (4th ed., revised by C. A. Mace, 1929).

by experience'.¹ But the statement of that distinction, of course, must not be taken alone. For Stout, as for McDougall, the term instinct would cover not only 'congenital aptitudes for executing' certain 'movements', but 'congenital dispositions' leading to certain appropriate modes of behaviour under special conditions.²

The concept of reflex inadequate for instinctive and purposive actions. Some of the facts we have given show that several of the commonly accepted distinctions between reflexes and instincts do not always apply; and that reflex reactions taken as wholes are often more complex and more dependent on other factors than some have supposed. The distinction, however, remains clear between the two *types of actions* even if we can find actual *responses* which seem border-line cases. In instinctive actions there is an inward urge towards an end, and success or failure in achieving that end results in modifications of actions.

I am glad to be able to quote here a passage from a letter to me from Professor Stout after reading the published paper on which this chapter is based. 'It is important', he writes, 'to distinguish clearly two questions, (1) the conditions which initiate a reflex movement; and (2) the nature of the movement itself when it does occur. In what is called the "conditioned reflex" the process of conditioning seems to me to depend in all its stages on interest and attention. But the reflex movement when it does occur does not depend on attention for its execution. This holds good both before and after the conditioning. Both before and after, the reflex is only an incident in a process which as a whole is not a reflex.'

This brings out more clearly the distinction I have had in mind between the concept of a simple reflex (which as Sherrington said was even physiologically probably a purely abstract conception) and those actual complex responses which most physiologists and many psychologists would call reflex responses, but which contain more than a pure reflex and therefore are more liable to be confused with an instinct.

None of our evidence, however, as to the absence of a definite line of separation in the observed behaviour, favours a classification of all human activity as types of reflexes plus conditioned reflexes

¹ Op. cit., p. 335. See also his article on 'Instinct and Intelligence' *Brit. Jour. of Psych.*, III, p. 244. The co-operation of intelligence (or at least of 'an abiding state directing action to the attainment of certain results') in instinct as distinguished from reflexes is a very prominent element in the view of L. T. Hobhouse; but he admits a type of pure instinct in which 'the actions are all reflex- or sensori-motor'. See *Mind in Evolution*, p. 101 (London, 1915).

² Op. cit., p. 351.

such as Pavlov¹ and Bechterev² and some of the Behaviourists try to make. Pavlov showed first in his experiments with animals, that responses starting as pure reflexes can be linked with associated stimuli; he also pointed out that other reflexes are complex and not merely dependent on external stimuli. He then goes on to label as 'reflexes' such activities as the dog's 'guarding instinct'; even its craving for and determination to get freedom is a 'freedom reflex', and man's purposiveness is itself a reflex. 'Every one of us should cherish within himself this reflex as the most precious part of his being,' writes Pavlov, and urges that parents and teachers should seek to strengthen it.³ So there must also be a cherishing reflex! Unless one denies the possibility of conscious purpose influencing action, such a conclusion and such a use of the term reflex is confusing. It is not a question of determinism or freedom in human action. Even those who believe in complete determinism, may well require a different term, say 'instinctive tendency', in which the main urge is from within, and is diverted toward a conscious end to be achieved, in which feeling tends to be roused, in which the ways of satisfaction are varied, and especially in which the actions are guided by intelligence and modified by awareness of success and failure. Even if in the complexity of human actions, and in the gradualness of transition (if in the categories of human actions also—*natura non facit saltum*), there would be a need in psychology for terms which mark the main types of behaviour, in each of which one or two of various elements are relatively prominent, even if all the others are usually present to some degree. For the strict use of the term reflex, indeed, the presence of one element at least would exclude the term, namely, conscious adjustment of the mode of response to an end in view.

So far as early childhood is concerned, the main point I wish to bring out is that we have a variety of reflex activities, with very small gradations or with varying complications, which we may illustrate by examples already used.

(1) Pure reflexes in the first week or two—as 'pure' as we can get—for example, the sneeze, the shooting up of the arm at a jolt, even during sleep. But very soon the sneeze is enjoyed—expressions of feeling follow it.

(2) Sucking—but often very dependent on general bodily condition, though very soon the habit of sucking when not hungry develops: and there appears to be an urge to suck causing the

¹ See *Lectures on Conditioned Reflexes* (translated by W. H. Gantt and G. Volborth. London, 1928).

² See *General Principles of Human Reflexology* (translated by E. and W. Murphy. Jarrolds, London, 1933).

³ Op. cit., p. 281.

child to seek the stimuli, and to get his thumb up to his mouth.

(3) Eye-blink in response to touch—finally responding, through association, to a rapidly approaching object.

(4) The eye-blink in response to loud noise—but very irregular and varying according to bodily condition and occupation at the moment.

(5) Finger-grasp—used within the wider activity of the seizing of an object—functioning when sight and motor co-ordination bring the hand to the object.

Summary of general observations on reflexes in infancy. As this has been a long chapter with many detailed facts, a summary of main results may be useful.

(1) Reflexes (like spontaneous movements) may be more active under the stimulus of excitement; for example, even the irritation of the nose in cleaning caused a much stronger finger-grasp.

(2) At the earliest stages a stimulus of a reflex tends to cause general bodily activity as well as the specific response.

(3) Though less frequent in sleep, the finger-grasp reflex may occur during sleep, even in the 1st month, and at least as late as 0; 2½.

(4) Difference between right and left hands may be revealed in grasping reflex as early as 2 months. The reflex can occur in the left hand while voluntary grasping is done with the right.

(5) A change to thumb opposition in the reflex grasp seems to anticipate the beginnings of voluntary grasping.

(6) A striking example of the complexity of co-operation is shown when sight prompts voluntary (if erratic) movements of the arms, but touch is still needed to cause the finger-grasp.

(7) The gradualness of the development of voluntary grasping is shown by the long period taken from first occasional grasping to regular efficiency, and by the fact that the reflex may at times hinder voluntary grasping—a period of conflict that may last six weeks.

(8) A walking reflex in early weeks vanished long before voluntary walking was begun: but something like reflex responses to pressure on the feet seems involved again in the actual learning to walk. The vanishing of reflexes is illustrated also by the arm-lifting reflex, which remains, however, during sleep at least till 0; 4½. This was apparently a defence reflex.

(9) In the first few weeks loud crying stops sometimes so instantaneously on the impinging of a new strong stimulus that it suggests an automatic reflex inhibition.

(10) The eye-blink in response to an approaching object seems to be a 'conditioned reflex'—the eye-blink occurring first in response to touch. Over a long period in its development it is very variable and may be very unstable even when fully matured.

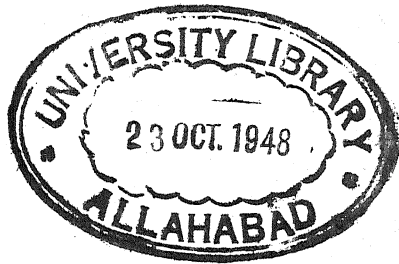
(11) The instability of some reflexes and the dependence of some on general condition makes reliance on them as tests of development undesirable unless they are tested frequently and under favourable conditions.

(12) Observations on reflexes in infancy indicate that some commonly accepted criteria for distinguishing reflexes and instincts cannot be rigidly applied.

For example, the supposed inevitability of a reflex is not a fact at least in the early months. It is an already familiar fact that the abnormal conditions of the nervous system seriously affect the occurrence of the reflexes. In early months the influence of the general condition seems to be normal and may determine whether a reflex shall or shall not take place.

(13) Reflexes, however, are lacking in the following characteristics of instinctive actions in human beings :

- (a) persistency, with varied effort—resulting in adaptations of the response to varying situations ;
- (b) self-originated seeking for the stimulus.



CHAPTER IX

The Beginnings and Significance of Play

The definition of play applied to infant activities. In endeavouring to trace the first beginnings of play in the infant we are met with a difficulty we generally meet when trying to apply to the earliest stages of mental life a definition framed for a more mature level. We may start with a definition of play as 'any activity which is carried out entirely for its own sake'.¹ This, of course, does not rule out the validity of the theory of Groos that play is biologically valuable as a preparation for more serious activities of life later on. Nor indeed does it rule out entirely Herbert Spencer's theory that play is an outlet for excess of energy, that is if we refer the 'excess of energy' only to the particular special impulse or interest, which may be consistent with a considerable degree of *general* fatigue. Neither do we rule out entirely the theory of play as a biological repetition, in the young, of activities as they have developed in the race. For there is normally delight in an activity indulged in for its own sake, all successful activity indeed tending to be pleasurable; and such delight is likely to be specially strong in the successful performance of some new activity or the experience of some new capacity. Hence there will tend to be play with each capacity or innate impulse as it develops partly because of its mere novelty; and here we see an element of truth in the theory of play as biological repetition.

We must however add a proviso to our definition. The satisfaction of bodily needs such as hunger is not a form of play; though the gourmand in eating for eating's sake comes near to a form of play. Similarly the stretching of a stiff limb may be performed for its own sake—it is enjoyed; but we should hardly call it play. It is done primarily to get rid of an unpleasant sensation. Yet even in play proper we cannot always say the pleasure of the action is not at all dependent on previous conditions—for example the enjoyment of golf after close confinement. The added pleasure due to this, however, is not an *essential* element. We must distinguish mere exercise for health and play proper; play even when it helps development is, to use Groos's phrase, 'unintentional self-development'.²

¹ I have given reasons for adopting this definition in the section on 'Educational Psychology in the United Kingdom', *Year Book of Education*, 1936, p. 313.

² See *Das Seelenleben des Kindes*, p. 85 (Berlin, 1913).

Finally, when we say the activity is an end in itself we must not forget that it may be directed towards some end or object which itself forms part of the play interest, for example, in the making of a man with plasticine or the building of a sand castle. The activity is more worth-while because it produces the man or the castle. But the process of making is part of the true play, when, as so often, the child prefers to make it himself instead of having it made for him.

With the above general definition then as our guide we may ask, 'When do we find the first play and of what kind is it in the earliest years?'

As we have seen, the earliest movements of an infant apart from a few reflexes seem to be spontaneous movements due partly to processes taking place in the central nervous system and partly in response to the stimulus of the environment. These movements may be play in Herbert Spencer's sense of the term, but the definition we have adopted involves some conscious tendency to the reproduction of an experience found pleasant, or the carrying out of one which in idea is felt to be interesting or desirable, for example, the deliberate and repeated grasping of an object, which I noted at four months. Before this, of course, an infant may get his thumb into his mouth and suck for the sake of sucking; but perhaps this may be regarded as mere sensory enjoyment, rather than the beginning of a rudimentary form of play. The spontaneous movements, if they do not satisfy our criterion of play, do, however, fit in with Groos's theory of play to this extent, that they help to develop the muscles for more serious work later.

The first time that a kick is repeated merely to experience and enjoy again a sensation like that of the previous kicks, we have genuine play. Thus a large proportion of the activities even of the first months are really a form of play. At what stage the purely spontaneous movements begin to have in them an element due to the impulse to repeat a pleasant experience it seems impossible to say. But one gets the impression of the beginnings of this in such observations as these:

B, d. 67. As he lies contentedly after a long morning sleep and feed, his hands, feet, mouth and tongue are in constant motion. When alone he has been talking to himself a great deal: less when I was with him. Certainly the talking to himself when alone sounds like self-entertainment.

While we may agree that an activity, if repeated intentionally and merely for its own sake, is being found in some degree pleasurable, we must avoid saying that in play the child performs an act for the sake of the pleasure it will bring him: that would be intellectualizing the process too much. To the child the activity

and the pleasure are inseparable at this early stage. Karl Bühler, indeed, in discussing the criterion of play as *Funktionslust*, maintains that he who regards the activity and the pleasure as two ingredients, cannot describe the activity as an end in itself, while he who regards the activity and the pleasure as a unity can do so.¹

There is one type of play which we shall meet which a strict identification of play with completely pleasurable activity would hardly include. Keeping to our main criterion that this activity is engaged in for its own sake, we must include some which seem to be prompted by an urge towards an experience which is not completely and perhaps not predominantly pleasant, as when A at 3; 2 asked me again and again to play at 'being a lion' and chase him, even when the game had just ended in screams and tears. B did the same at 2; 7. Here the craving for a new experience, and perhaps the experiencing of an emotion rarely felt, was adequate motive, but the early stages of the game no doubt at least would be pleasurable.

One final general remark may be added. It does not need any *strong* motive for a child to do things. There is an element of truth in a view (quoted by William James) of Professor Lazarus; he denied the existence of an instinct to play, and held that there was only an aversion from remaining unoccupied, and hence a 'sham' occupation had to be devised when no real one was at hand.² Many of the activities of play in infancy are very trivial; and the child is quickly diverted from them. For most we need attribute no particular motive other than the love of the various activities themselves.

The first forms of play. The infant's play will naturally begin with those functions which develop first: in the first few months we find him especially playing with hand movements and with the production of sounds. Then comes the playing with parts of his own body, fingers, toes, ears, &c. About the same time begins the long series of handling any and every object that comes within reach, clothing, cups and other household objects, the splashing of bath water and so forth. Mere sensory experience or motor activity seems enough for enjoyment at this stage.

We may be more sure, however, of play in the strict sense of the term we have adopted, when we have either (a) obvious delight shown in an activity, and (b) a constant repetition of the same action. These are especially likely to accompany or follow the first, or at least an early performance of a new action. Thus at 0; 2½ B learned the trick of carrying his dress or eiderdown between

¹ *Die geistige Entwicklung des Kindes*, Fünfte Auflage, p. 458 (Jena, 1929).

² See his *Die Reize des Spieles*, p. 44, quoted by William James, *Principles of Psychology*, Vol. II, p. 429.

his hands, and later with one hand up to his face, and he was fond of repeating this for long periods.

Professor G. V. Dearborn thought that his daughter as early as 0; 2½ voluntarily shook her rattle after spasmodic movements had sounded it.¹ Miss Shinn was also convinced that movement 'purely for the pleasure of the sensation' took place late in the 3rd month, if not earlier.² I made the following note of

B at 0; 4½. Yesterday he discovered the trick of sucking his lower lip and to-day he has practised it constantly. Often practises singing by starting on a high note and running down a kind of scale.

Also when just beginning to learn to creep :

0; 4½. Screams of intense delight when put on the floor to creep.

At 0; 4½ I noted 'Extreme delight in playing with my hair shown by top-note screams'. This early appearance of social play (and even earlier examples of mutual laughter at some play) illustrate the influence of the presence of a known and liked parent, instead of a strange infant or adult, with whom social play only appears appreciably later.

A new performance which caused great pleasure was striking the piano keys and producing the sounds. At 0; 5 B struck the notes as many as 49 times in three minutes with cries of joy—, By 0; 6 B was also extremely fond of banging things—toys, spoons, &c., on his table and apparently enjoyed making the noise.

At 0; 5½ he was so fond of grasping at things that this constantly made dressing him more difficult. Often when nursing at the breast he would stop to grasp at his mother's dress, a chain, a paper she was trying to read, and so on. All our children would often turn from the breast or bottle in order to play. Notes on both A and B at 0; 6 show that after the first few mouthfuls, a very slight diversion was enough to stop the infant feeding, a fact which has a bearing on the supposed intense fixation of the libido on the breast during the suckling period.

There was apparent enjoyment in babbling at least by the 3rd month, and also special practising of a newly-acquired sound. Speech development owes much to this delight in practising mere sounds—first spontaneous sounds and later imitated ones. Thus Y at 0; 6 is noted as constantly practising for a week or more two new noises: (a) a kind of lip trilling, and (b) a sound like 'tch'. At a later stage the newly discovered use of names was indulged in tirelessly for days and days, then the first use of two words together, and so on.

First social play. Responsive babbling and laughter may be

¹ *Moto-Sensory Development*, p. 33 (Baltimore, 1910).

² *Notes on the Development of a Child*, I, p. 188, including footnote.

regarded as the first form of social play, occurring at least by the 3rd month, when it was often repeated and much enjoyed. Apart from this, however, and one or two other doubtful examples (e.g. the play with the hair at 0; 4½) there was social play at least by 0; 5.

B. Greatly amused (d. 165) by my repeatedly covering him with eider-down which he knocked back each time with one motion of his arms. On d. 182 this was done 100 times in quick succession until I tired.

My part in the game possibly gave B a feeling of overcoming me; though at 0; 7 he was seen playing the same game of peep-bo with the eiderdown entirely by himself. Mrs. Fenton observed her boy also in the 7th month playing a 'peek-a-boo' game by himself with his blanket, and she says he had not been taught this. She attributes it, reasonably I think, to 'the search for visual experiences'.¹

Rough, romping play seemed to be enjoyed from now onwards. Thus B at 0; 6 loved to have a big cushion thrown at him from several feet away—sometimes hard enough to bowl him over. Charlotte Bühler records social play at 0; 6 and 0; 7—'the infant trying eagerly to include anyone who is present in its play'.²

Play between 6 months and 12 months. The following notes illustrate various types of play in the period from 6 months to 1; 0. At 0; 6 there is still delight in mere bodily movement. Thus:

B at 0; 6, d. 195. The last two days especially he has been so merry—cooing and shouting most of the time when awake, and not needing toys to amuse him—only to be laid on his back and allowed to kick and roll.

0; 6½. We noticed for the first time a new movement: he took a spoon by the handle and then gyrated his fist so that the spoon described a semicircle in the air. He repeated this five or six times, watching it meanwhile.

0; 6½. Drops his napkin ring deliberately several times on his tray, apparently to make the noise. 0; 7 and 0; 8. Constantly banging toys on his table and dropping them on the floor.

0; 7½. Struck notes on the piano one hundred times—with signs of great pleasure. At 0; 8½ he banged his aluminium cup so hard on his chair that his eyes blinked each time—apparently a fearsome joy, but kept up a long time.

0; 7½. Repeatedly made loud quacking noises like a duck, different from any heard before, on staircase, apparently to hear the echo. Nurse says he also does it under the railway arch where there is an echo. She says he began it two days ago. At 0; 8. When not hungry or sleepy he is almost invariably in a state of exhilarant joyfulness and always active. And again at 0; 8½. Even when being dressed his hands are off to play with anything within reach.

¹ See *A Practical Psychology of Babyhood*, p. 27 (Boston, 1925).

² *From Birth to Maturity*, p. 55.

As an illustration of typical activity I quote a period of ten minutes play by B (age 0 ; 8) in his playground, with only a small basket, a tray, and a toy donkey. I made this kind of record occasionally to illustrate the apparently commonplace performances which entertain a child at this early age. The fact is that an active healthy infant has an insatiable appetite for sensations, movement and manipulation. Indeed, a great part of Miss Shinn's lengthy volume *Notes on the Development of a Child* is a record of the enjoyment of sensations and playing at movement and manipulation. It is very important to recognize clearly this aspect of child play in the first and second year especially. Otherwise the idea that play is primarily a means of satisfying social or aggressive impulses, or that it is a subtle symbol or expresses a phantasy, may be given far too great importance. Take an example from Miss Shinn's book: her niece at 0 ; 7 and onwards showed an intense desire to pull the cat's fur and dog's tail and ear. It is not, however, necessary to attribute even this to cruelty or the satisfaction of assertiveness; for as Miss Shinn remarks: 'from the time that grasping was acquired there often seemed a special satisfaction in pulling at a fastened object more than in obtaining possession of a free one'.¹

Record of B for ten minutes in play-pen at 8 months.

Rolled over with tray in both hands—gnawed it, cooed, tray slipped to left, he rolled over on it: tray seized with right hand (R) and moved about: basket pushed with tray (in R) basket seized with left hand and tray with right; now tray with left; basket rolls to his left so he crawls round, tray in hand; tried to lift up tray from floor with R and L alternately: succeeded with right; then seizes basket so tray drops; tries to lift tray again with R chiefly: pushes it into corner: crawls well over it: eventually gets it up with left: high 'coo': waves it with left; reaches over to left with right for basket and throws it to right: seizes tray with both hands and turns it over: tries to pick it up with right; takes basket with right and puts it on tray: picks up tray with both hands, especially left. Puts basket on tray and lifts tray, basket rolling off; lifts tray with L; takes donkey in right and bites it: tries to pick design off tray with right forefinger: puts donkey on tray and turns it over with R. Again tries to put donkey on tray, but it is too far: moves tray with right, tries to turn it with left: rolls over with it in both hands: kicks tray repeatedly as he holds it in left: bites tray, rolling on his back: tray falls: tries to raise it with left, but changes to right and succeeds: looks round at sudden new sound of typewriter and watches his mother though he cannot see her moving.

Note the persistent play with one object, the tray. Similar persistence was being shown at this time in practising new sounds; this was noted in all our children during the period about 0 ; 8, to 1 ; 0.

¹ Op. cit., I, p. 190.

At 0; 8½ B had a period of a few days when he particularly enjoyed waving things about wildly, handkerchiefs, bibs, pieces of cloth, &c. This is typical of the way in which a particular kind of play would begin, occupy a lot of time for a few days or weeks or even months and then disappear. Several other observers have noted this. Thus Mrs. Fenton's boy had a 'mania for dropping things' about 0; 10, while shoes were his consuming interest for a long time after 1; 2.¹ Miss Shinn's niece had a special interest for climbing when she was 1; 1 and it rose to be her 'greatest interest' at 1; 4.² Mrs. Marjorie Thorburn writes of her own baby:

At ten months she liked to throw down a brick, stoop and pick it up and give it to her mother, her mother to give it back to her, she to throw it down, pick it up and repeat all over and over again. At 11 months another game was equally popular and equally unvarying; she passed a brick left hand to right, to her mother's left, her mother's right, her right, her left, her right, and so on interminably.³

Sometimes B would seem to set himself *difficult tasks*. Thus not long after learning to stand up he tried to stand up while holding his big ball in his mouth. There were repeated failures, the ball dropping, but again he would try until successful. Remarkable persistence was shown not only in such new and difficult tasks, but sometimes also in easy and simple games, especially if another person joined in. Thus:

0; 10. Threw sugar tongs on the floor. Frl. L. picked them up, and so on about fifty times, B laughing constantly.

Here is a form of social play, which also appears in several notes of B at 1; 0, which report was giving us things—toys and scraps of paper—and then receiving them back.

Play between 12 and 18 months. About 1; 0 appeared for the first time genuine play with an imaginary object. Thus Y at 0; 11½ imitated the feeding of her dolls with a spoon. His mother noted of B, at 1; 0:

Held out his closed hand to me saying 'Ta', as if about to give me something, and when I held out my hand, pretended to put something in it, then drew his away and laughed. This was repeated many times and I also did it to him, he holding out his hand for imaginary gifts.

Play with imaginary objects will be referred to again under the period 1; 6 to 2; 0.

At 1; 0 B was fond of turning over leaves of his linen book and gazing especially at the picture of a dog. He would make

¹ Op. cit., pp. 30 and 33.

² *Notes on the Development of a Child* (I, 1909), p. 368.

³ See *Child at Play*, p. 25 (London, 1937).

kissing noises to it. The psycho-analytic reader must bear this in mind when I relate that at 1; 3 he also made kissing noises while looking at a print of the Mona Lisa!

So strong was the impulse to play now that even when intensely eager for his food—kicking with impatience—he would after a few spoonfuls insist on being put on the floor to play, his food being brought to him.

Professor Kellogg also often found that his child of about 1; 6 (and his ape of about 0; 10) 'could not be induced to eat his meals while the other was playing, so great was the impulse to get down to play also'.¹

At 1; 1 B's favourite toys were noted as: a wooden hoop to put over his head, a wooden spoon to bang things with, cards to put in and take out of a box, a trumpet to blow, and picture books in which the mere turning over of pages seemed an interest in itself.

It was clear in the play of all the children that *new bodily performances* delighted them. Climbing stools or stairs was indulged in, especially by B and C, before they could walk properly. Any new trick was practised repeatedly, including in the case of

B, at 1; 1½ repeated steady striking of his head; at 1; 2 bending down looking between his legs and grasping a toy behind his heels; at 1; 2 dancing up and down (bending his knees) at sound of barrel organ; at 1; 3 supporting himself on his head and feet as though trying to stand on his head; 1; 4 'waltzing' round and round in his playground (while I played the piano) uttering high shrieks; 1; 5½ dancing up and down sometimes to his own banging on piano, or first playing a few notes and then dancing and so on. C, at 1; 2½. Great and repeated laughter while bending himself backwards on the couch.

Mrs. Fenton also records the repeated practising of difficult 'stunts' at 1; 2, e.g. walking backwards or doing a 'goose-step'.² Miss Shinn states that during the period 1; 2—1; 6 'a noticeable trait was the child's interest in doing something novel with her body'—e.g. walking with her head thrown back, walking backwards (practised 'all day' when first discovered).³

Social play. We have already seen how very early some form of social play occurs. Further varieties now appear. Thus

Y, 0; 11½. When a doll was given her, held it to each person present in turn, making kissing noises till each had kissed it, thus bringing us all into her play. B, 1; 0½. Pulls M's hair or the nurse's, and if they do not scream in pretence he screams for them. B, 1; 2½. Teased his mother

¹ See *The Ape and the Child*, by W. N. and L. A. Kellogg, p. 119 (New York, 1933).

² Op. cit., p. 34.

³ Op. cit., p. 371.

when she wanted to take something from him by holding it out over the couch end saying 'ta, ta', and then dragging it away when she tried to get it and laughing until he nearly collapsed.

Kellogg's child at 1; 1 (and his ape at 0; 11) would often hand an object to a person, receive it back, and so on repeatedly.¹ This was a common event at this period with my own children. D. R. Major reports that a desire for companionship in play seemed to be shown by his child by 1; 1 or 1; 2, and that at 1; 2 there was play with a baby of the same age, and by 1; 4 he was often 'begging' people to play with him at ball.²

In social play at this period a factor of very great importance is the degree of familiarity with the other individual. Though with the parent or with other infants well known to the child a form of social play may appear at 5 or 6 months, it may be quite otherwise with strangers even at 10 months or a year. Thus Miss Mary Shirley found that when two infants of 0; 10 were put together in a play-pen, they paid little attention to each other. When one toy was provided there was usually a dispute as there was often even when two toys were provided.³ Also Dr. Katharine Bridges, observing infants of 0; 9 and 0; 10, found that when they were first put into the pen together they paid little attention to each other, but that by the end of a month there were the beginnings of social play.⁴

Yet Van Alstyne, in a study of 112 children of 2; 0 to 5; 0, found that only 10% of the two-year-olds co-operated in play.⁵ There are no doubt great individual differences in this matter—as indeed the studies of Mary Shirley and K. Bridges referred to reveal; but the very early age at which social play is recorded with the mother or father makes it probable that familiarity with the other person is a main factor; and not mere familiarity but kindness and signs of affection. Even the play of the Dionne Quins, though brought up together, at 2; 2 was largely individual, though there was social play at 1; 8 and group play at 3; 1.⁶ The contrast between playing with the mother and with a strange child appeared markedly in B at about 1; 6. When a new toy arrived at 1; 5½—a set of bricks—he would hardly try to build himself, but gave them to M (his mother) one by one for her to build. Yet when almost for the first time he played with a baby of his own

¹ Op. cit., p. 131.

² *First Steps in Mental Growth*, pp. 242-4.

³ *The First Two Years*, Vol. II, pp. 74-6.

⁴ 'A Study of Social Development in Early Infancy': In *Child Development*, Vol. IV, 1933, p. 43.

⁵ See Stoddard and Welman, *Child Psychology*, p. 277 (New York, 1934).

⁶ See *Collected Studies on the Dionne Quintuplets* (Univ. of Toronto Press, 1937).

age (1; 6) he resented her touching his toys at first, though when reproved mildly he gave some to her.

Imitation in play. In the growth of this social play, imitation seemed to play a considerable part. Imitated actions entered more into the play of my children from about the age of 1; 0. At 1; 3 B imitated my feeding his donkey. At 1; 4 A imitated my bouncing of a ball. Much of Y's play especially was imitative. At 0; 11½ Y after seeing a brother turning somersaults, his head on a cushion, twice lay down and laughing put her head on the cushion. W. N. and L. A. Kellogg, who brought up their little boy with a young ape as companion, noted the prominence of imitative play in their boy at this same period (about 1; 2-1; 4), the boy imitating the young ape far more than the latter imitated the boy.¹

On the other hand, many imitative actions such as I have recorded in the next chapter on Imitation, cannot properly be labelled play. They seemed to be rather the outward expression of a particularly vivid impression. It seems to be genuine play, however, when a child not only imitates with obvious delight, but also repeatedly carries out the action. A demand for imitation may also enter into play. Thus Y at 1; 4 imitated S₁ (Sibling) and S₂, who were playing at lying down dead. A few days later Y lay on the floor. M imitated her and Y looked up and pointed to me and grunted in a requesting way. I lay down too and then she seemed satisfied. These and many similar occasions with Y and the others illustrate the close connexion between the almost automatic imitative impulse (which I have exemplified in the next chapter) and the beginnings of social play proper.

Imitation also led to playing with new kinds of toys. Thus at 1; 1½ I was surprised to find how entertained B was in imitating my use of a simple cardboard formboard I made, with one square inset and one circle. Each was put on the hole haphazard, but with much excitement, feet kicking, &c. My impression was that here again, as so often, there was delight in performing a new trick—a satisfaction enough to carry the infant over a period of effort. Certainly at 1; 3 B tried for at least 10 minutes to fit pegs on the edge of a tub, often with little success, as they kept falling off, on which he would heave a deep sigh. Here again we find interest and persistence in doing a difficult thing. Similarly when B got his foot trapped between the step of his go-cart and the bar, he would not accept help, but eventually got it out himself, and then put it back and practised the awkward task again.

This type of action may be worth observing to see if it would serve as a possible test even at this early age of temperament; but many careful follow-up studies would be needed, and in view

¹ *The Ape and the Child*, p. 141 (New York, 1933).

of the varied and changing phases which some (and perhaps most) children pass through, we cannot at present take any lack of such persistence at this age as necessarily a bad sign. As to this particular child I can add that similar persistence did remain in later development in reference to things about which he cared sufficiently.

Although new and difficult tasks were specially fascinating, and though the co-operation of a mother or father in play caused special joy, there were continually periods of contented play with simple things. Thus this note is typical:

B, 1;4. Plays more with his toys now. Happy and quiet for long periods in his playground—makes his animals stand up now—a new point.

The fact that when novelty is lacking, contented playing with the commonplace was still shown at a year and a half is revealed by this record of another 5 minutes play.

Five minutes continuous play at 1;7.

B carried glove box into room: put it on couch: climbed up: upset it and put gloves back: climbed down and went to window: got on the footstool and looked out: back to couch and climbed up. Threw glove box to floor: got down, put gloves back and carried box back to hall: brought in basket to M (who now entered room): fetched glove box to her on couch: grunted till she lifted him up beside her: brushed her dress with brush: put basket and box on her lap (still sitting by her) got off couch: tried to take things out of M's work basket: sat on stool and played with three cards of wool. Thunder occurred at this point. B got up and looked out of window and tried to open window: climbed chair by window and tried to open window: tried to open work basket again: laughed when M smacked his hand: sat on stool and kicked his heels: put wool cards back into basket and said 'go' (= gone): sat down: got up and got cards out again.

Repetition in play. 'Children', wrote Freud, 'repeat in play everything which has made a great impression on them'.¹ No doubt, but certainly also at this stage at least, they may repeat over and over again many things which can hardly have made a profound impression. As we have seen, from the earliest months almost every new experience or accomplishment—whether it be smacking the lips, the sensation of banging the heels, making new speech sounds, grasping the other hand or the toes and then other objects, banging one thing on another to get the sound, putting things in boxes and taking them out, dropping a mug from a tall chair as often as an indulgent parent will pick it up, all these and scores of other things are practised, sometimes a hundred times in immediate succession. Even Kellogg's ape, when at 0;8 she

¹ *Beyond the Pleasure Principle*, p. 15.

'discovered the joys of dropping things' from her high chair, became 'addicted to the habit'.¹

Thus it seems quite gratuitous to drag in subtle unconscious motives into the play of infants at this stage, as is done by Freud in his *Beyond the Pleasure Principle*. There he tells (p. 12) of a boy of 1;6 who used to throw his toys into the corner of the room or under the bed, with an 'expression of gratification', though the mother interpreted the drawn-out cry 'o-o-oh' as *fort* (go away). 'One day', writes Freud, 'I made an observation that confirmed my view. The child had a wooden reel with a piece of string wound round it. It never occurred to him, for example, to drag this after him on the floor and so play horse and cart with it, but he kept throwing it with considerable skill, held by the string, over the side of his little draped cot, so that the reel disappeared into it, then said his significant "o-o-o-o" and drew the reel by the string out of the cot again, greeting its reappearance with a joyful "*Da*" (there).'

'The meaning of the game was then not far to seek. It was connected with the child's remarkable cultural achievement—the foregoing of the satisfaction of an instinct—as the result of which he could let his mother go away without making any fuss. He made it right with himself, so to speak, by dramatizing the same disappearance and return with the objects he had at hand.'²

To one who has watched daily the play of a number of infants from the earliest months, this explanation will, I think, appear fantastic. Nor indeed is it such a 'remarkable cultural achievement' for a child of 1;6 to learn not to cry when a mother leaves it for a time. An active-minded child (as this infant observed by Freud seems to have been) must even at this early age often be about his business of learning and experimenting and does not want invariably to be on his mother's knee.

Make-believe play from 1½ to 2½ years. This is, of course, a common type of play among three- and four-year-olds as the records of nursery school and other observers show; but just as the daily observation of infants in the home discovered social play at a considerably earlier age than that reported in observations on groups of infants, so make-believe play was observed at a much earlier age in the intimate life of the family. I have already recorded of B that as early as 1;0 he pretended to give his mother something in his hand when there was nothing there; and Y fed her dolls with imaginary food at 0;11½.

That great pioneer in infant psychology, Preyer, refers to his child at 1;10 holding an empty cup to his mouth, sipping and

¹ Op. cit., p. 119.

² Op. cit., p. 13.

swallowing. Preyer thinks that much of such supposed 'imagination' is really due only to vague concepts—'cup' automatically suggests 'drink' and 'drink', 'swallow'.¹ He seems to regard this action almost as one which would be called a 'conditioned reflex' nowadays. But surely Preyer for once has gone astray. It is incredible that a child (e.g. B from 1; 0 to 1; 2) who repeatedly offered us imaginary gifts and received imaginary gifts from us (with no object there to suggest the action) confused the entire blank with some toy, or the imaginary 'sweetie' with a real one. Beside the game is enjoyed as a *pretence*. I quote a note made at the time :

B, 1; 0 held out his hand to us saying 'Ta' as if about to give us something. I held out my hand and he pretended to put something in it, then drew away and laughed. This was repeated many times, and I also did it to him, he holding out his hand for the imaginary gift.

Karl Bühler, in arguing that make-believe games at a later age are not really illusions, points out that a child will sometimes get a shock if a toy animal makes a noise by some hidden mechanism, as I myself have observed.²

Possibly some of the actions that I have recorded in the next chapter as examples of imitation were also a form of 'pretence play'; both A and B, for example, at 1; 0, after watching me smoke would throw back the head and puff in a similar manner repeatedly. So did Sully's boy at 1; 4.³ Also Y at 1; 2 would imitate our reading by putting her face close to a book and muttering softly.

Several other observers record make-believe play by about 1; 6 or even before. Miss Shinn's niece would pretend to be hurt in order to get a kiss at 1; 2, and at 1; 3 would bump her doll's head and bring it to be kissed. At 1; 8 she would offer her parents little sticks to eat.⁴ Professor Dearborn's child at 1; 4 would show her dolls and pictures to other dolls; ⁵ Sully's record of the boy who at 1; 6 seemed to pretend to be going away saying 'ta-ta' and yet constantly returning, looks like pretence play.⁶ Mrs. M. Thorburn at the end of her record of her daughter for the period of 1; 0—1; 6 says, 'the ability to pretend' showed itself occasionally in picking up imaginary articles and putting them in a box or taking from her mother's hair an imaginary hair slide and inserting it in her hair.⁷

¹ *The Mind of the Child*, Pt. II, 'The Development of the Intellect', p. 16.

² See his *Mental Development of Children*, p. 94.

³ *Studies of Childhood*, p. 417.

⁴ See her *Notes on the Development of a Child*, I, p. 153 and p. 27.

⁵ See his *Moto-Sensory Development*, p. 162.

⁶ See *Studies of Childhood*, p. 434.

⁷ See her *Child at Play*, p. 30.

After 1; 6 pretence play becomes more frequent in the children observed. I append further notes:

B, 1; 8. Pretends to take drinks out of an empty cup between his bites of his food. 1; 10. Plays a game with an imaginary ball—dropping it downstairs. Stoops to pick up the imaginary ball and goes through the action of throwing it down. This coincides with a period of special delight in watching my drawing of cats, trains, &c., on paper.

Plays games of imagination now. I dropped a safety pin and told him to look for it. He couldn't find it but repeatedly came to me with his hand closed saying 'Ta' and pretending to put it in my hand. Later, when not allowed to have a cake, he reached to the empty cake tray and pretended to take a cake, putting it in his mouth and eating it and then saying 'Good'.

Sometimes the pretence was a means of teasing, thus:

B, 1; 9. When put into bed, wanted to kiss a chair. When I held it up to him, he flung himself down in bed and pretended he was going to sleep. When I put chair down, up he sprang again. 'Had me on' like this a long time, laughing hugely.

Also at this period *imitation of actions seen in pictures* was active: for example, a picture of some one running would set B off running violently up and down the room.

This impulse towards such simple imitation and make-believe play must be borne in mind when interpreting play which may appear to express some fantasy or unconscious wish. Such interpretations seem unnecessary if there is such a strong tendency to act all sorts of activities seen.

A note on A shows that he too at this period (1; 8—1; 10) played such imaginative games as feeding his horse or pretending to eat his rusks out of an empty box. Also Y at 1; 11½ 'Pours imaginary tea into her doll's teacups, puts in imaginary sugar, and so forth.' At 2; 1, 'Takes imaginary chocolates from her pocket and hands them round.' Mrs. Thorburn reports similar feeding of dolls with imaginary food during the period 1; 6 to 2; 0.¹ Vilhelm Rasmussen's little girl played similar games at 1; 8—letting her doll touch her father's coat, and then scolding and smacking it.²

A puzzling note of mine on B either shows how far this kind of imagination can be stretched, or suggests a genuine bit of animism.

B, 1; 10 came to me to have his neck tickled this morning; then ran to a chair and said 'chair k-i-i-i' (tickle) touching first the chair and then his neck. He was apparently pretending that the chair was in some way being brought into the game.

Rasmussen lists as 'animism' the action of his little girl at 1; 11, in showing the pictures of birds to her Teddy-bear and

¹ *Child at Play*, p. 32.

² *Diary of a Child's Life*, p. 44.

asking it, 'What is that?' and adding to her mother, 'The little bear sees.'¹

Stern reports his little girl of 2; 2½ as putting on her head a block of wood she played with as a ball and saying 'lovely hat', and bandaging a healthy finger and saying 'sore finger'; also at 2; 7 symbolizing a train by four chestnuts.² Sully reports that a boy 'not yet two years old' pretended to paint the furniture with the dry end of a rope.³ Major's child at the age of 2; 1 would feed dolls with a bottle and at 2; 5 roll up a piece of paper and play with it as a telephone.⁴ Rasmussen's Ruth at 2; 3 played at 'sweetshop', opening packets of imaginary sweets.⁵

Further notes need not be added as we have come to the period when such imaginative play is commonplace. Indeed, it has been used by some psychologists as a test of development. Dr. Arnold Gesell noted such 'dramatic play' as pretending to smoke or read in about three-quarters of the children observed at 2; 0, but only about a quarter or a third at 1; 6. Gesell regards dramatic play as having considerable development significance.⁶ Dr. Charlotte Bühler gives a social element in fiction play (e.g. feeding a Teddy-bear and putting him to sleep) as a development test for the third year.⁷

Of course the right placing of a particular game at a characteristic year will depend on the nature and complexity of the game; thus Gesell puts the game of pretending to telephone for a doctor at the mental age level of 3; 0.⁸ But some types of make-believe play, as we have seen, may appear soon after 1; 0 and became common by 1; 6 among the children here reported on. It must be recalled that the I.Q.s of my own children ranged from about 125 to 145; Miss Shinn's niece was almost certainly somewhat precocious, and so probably were several of the other children mentioned. Miss Shirley in her report on 25 infants observed says that imitative and dramatic play (e.g. playing at 'being bears') began about the period 1; 6—2; 0.⁹

When comparing the dates of the first appearances one has not only individual indifferences to bear in mind, but the fact that early mental development is *intermittent*, as pointed out in Chapter IV (p. 54). A function may reveal itself one day under very favourable conditions, and then an interval of days or even

¹ *Ruth: Tagebuch über die Entwicklung eines Mädchens*, p. 25.

² *The Psychology of Early Childhood*, p. 269.

³ *Studies of Childhood*, p. 37.

⁴ *First Steps in Mental Growth*, p. 234 and p. 237.

⁵ *Ruth*, p. 37.

⁶ *The Mental Growth of the Pre-School Child*, p. 153.

⁷ See C. Bühler and H. Hetzer: *Testing Children's Development from Birth to School Age*, p. 145.

⁸ *Op. cit.*, p. 153.

⁹ *The First Two Years*, Vol. I, p. 145.

weeks may lapse before it recurs, then another interval and so on with shortening intervals. Some examples of pretence play were, no doubt overlooked, but in accordance with this principle of intermittence we should expect considerable intervals at first.

Main play activities, 1;6 to 3;0. Considerable space has been given to make-believe play because of its special psychological interest. If, however, we are to keep a proper sense of proportion in picturing the play characteristics of this period, it must be emphasized that a great part of the play continued to be of the type exemplified in the five minutes record made on B at 1;7. More complicated bodily performances are practised—walking, running, jumping off a chair, &c. At 1;8 B 'enjoyed practising walking on a broad curb edging, for a long time'. Climbing seemed to have a fascination for all the children (except perhaps one) about this age, and we allowed considerable freedom, while guarding against serious accidents. Thus, C would gladly climb alone on the top of a pair of household steps which were exceptionally high. Also

B at 1;8 fell down half a flight of stairs—on his back: kept his head from bumping till the bottom. Screamed loudly for about half a minute. I took him from the nurse's arms, but at once he wanted to be put down and started climbing stairs again! No fears here! He fell through leaving go of banisters to hold something he was bringing to me. A few days later: Jumps from couch repeatedly. Once he fell on his face and cried hard: but almost at once climbed up and jumped again. Hurt himself again but again persisted. B, at 2;8. Climbed up the banisters on the outside.

Miss Shinn also noted that her niece (about 2;2) was still 'eager to do new and difficult things'.¹

Toys such as bricks are now more elaborately arranged, scribbling with a pencil (both right and left hand) developed, the possibilities of the piano were explored and so on. For example, notes on B's play at this period were:

1;11. Arranging bricks neatly in long straight lines. 2;0. Arranging bricks and toys in a design with a curve and a straight bisecting line. Building bricks into a tower decreasing in width towards the top.

Playing extreme bass notes on the piano, then extreme treble and so on, as though comparing them.

The following is a list of toys or games found of special interest to B during the period 1;6—2;6:

1;8. Stepping over bricks arranged in rows. 1;9. 'Fishing' with a magnet and string. 1;10. Building with bricks. Looking at pictures.

¹ See her *Notes*, I, p. 195.

'Drill'—with stick behind shoulders. Imitating monkey walk. 1; 11. Montessori geometrical insets and blocks. (A could do the cylinders at 1; 8.) 2; 0. Ball for kicking. 2; 2. Blackboard and chalk.

Y's favourite toys or games at this period we noted as: dolls and pram, digging in the garden, building with bricks, imitating reading and knitting, and many other imitations.

Joining in the various activities in the house of the mother, father and brothers or sisters was a constant form of play. With intellectual growth, there was playing at saying new words, at learning the names of animals on a set of animal bricks and picking the right ones out when the mother called out a name. Such play will be plentifully illustrated in the chapter on Language. A good example of intellectual play is given by Dearborn; of his little girl at 1; 11 he noted: 'enjoys saying opposites in quick succession'—get up, get down, get up, &c., or white bread, brown bread, white bread, &c.¹ Pictures afford increasing entertainment, even if one cannot strictly call this play. About 2; 0 B also loved to have pictures drawn for him and guess what they were, losing interest as soon as he had guessed, and then wanting another one.

The *social aspect* remains prominent. When there was a new baby while a child was between 2; 0 and 3; 0, doing things for the baby was usually a delight. Thus of one child at 2; 6 I wrote 'Likes to stroke and kiss baby; to-day lay down beside him with his head on the same pillow, and said — (own name) go bi-bi. All of the children would do almost anything with either father or mother for the sake of entertainment, especially if there was some novelty about it, for example, my teaching them to do little gymnastic feats. About several of the children I have notes indicating that it made an immediate and marked difference to their signs of affection for me if I was able to find time to play with them a great deal for a day or two. Our eldest boy had rarely any slightly older children to play with; but at 1; 9 he often played with a boy John (aged 2; 10) and I noted: '— is very subdued with John, doing everything that John tells him. He seems too interested in watching John to care about his own way.'

Music was often the cause of delight in vigorous movement: thus

B, at 1; 6. Plays the piano, then dances to it, then plays again. 1; 8. Seems to beat time now (sometimes correctly) with both hands when he hears a band or barrel-organ. 1; 9. Waltzed round when I sang a lively tune this morning. 1; 10. Danced spontaneously to sound of a funeral march (which I tried on purpose) played on the piano. B dances even when he hears a man whistling.

¹ Op. cit., d. 181.

Most of these forms of play had their *special periods of popularity*, just as we noted of the period round 1;0. The most notable development in B's play in the two or three months after 2;0 was his love of drawing with a pencil, including attempts at making triangles and circles which I had been drawing for him for the testing of perception of form. He was sometimes pleased with his performances and he would also worry me insistently to draw things for him at this time. Around 2;9 there was a period of intense interest in mechanical toys. Rasmussen also notes the great frequency about 2;4 of his daughter's playing at drawing, and also at making paper packets.¹ These periods of special concentration on a form of play are really I think another aspect of the love of novelty, the enjoyment of a capacity newly discovered or rapidly developing. Not that novelty is the only attraction of course; some forms of play have so strong or so complex an appeal that they persist over years: but even when a particular form of play is almost 'worked to death' for a time (the paradoxical phrase seems the only suitable one) there was a *relative* novelty about it—new possibilities were not exhausted, new skills were not yet *mastered*. This kind of thing lasted even through adolescence, when some new hobby would be taken up with enthusiasm, a great part of most days spent on it for several weeks of a holiday, and then the hobby suddenly dropped perhaps for ever.

Play with novel sensations or emotions and impulses. Such interest in the relatively novel is not confined to the bodily skills or new kinds of toys. Observations compelled me to conclude that it extended to new sensations and to maturing emotions and innate impulses. Thus *playing with a novel sensation* is suggested in a note on

B, 1;6½. In his playground he turns round and round singing, till suddenly he sits down with a flop and a little cry apparently of pleasure as though enjoying the sensation of giddiness.

Miss Shinn thought that her niece at 1;2 was 'experimenting with pain' when she played at pricking her finger with a pin.² From 1;8 to 2;6 and later, B and at least two of the other children, would love me to 'play at lions' till they screamed apparently with fright—only to beg for it again. Here we seem to have *playing with a novel emotion*. At least a game is loved in which the excitement more than balances any inherently unpleasant emotion. Playing at fear in another way, a kind of acting, seemed to show in Y at 2;3. M said at dusk 'Pull the curtains to.' Y, 'Oo'es—dark, very dark,' frowning and putting on a very anxious and fearsome expression. Sometimes she played with a more angry expression,

¹ See his *Ruth*, p. 38.

² Op. cit., I, p. 152.

shaking her curls, puffing out her cheeks and lips. I fancied here that there was an effort to experience the emotion by acting it, just as imitation of pictures seemed to serve as a means of fuller entering into the experience. In some of such playing with the unpleasant there may be, as Freud suggests there is in repeating an unpleasant experience, a vague attempt to gain a more thorough mastery over it.¹

At 2;0 a strange game of B's own devising seemed like *playing at assertiveness and contradiction*. When M asked 'Does B love Mummie?' B said emphatically 'No.' Then B suggested, 'Daddie'? and finally M gathered she had to ask 'Does B love Daddie?' B, 'No.'

Here surely there is revolt! But No! For B then indicated various favourite toys until M asked, 'Does B love Pussy?' B, 'No,' and so on, B keeping on pointing out various objects in the room. This game was played several times in the course of a few days. Similarly Y at 2;7 after contradicting M in something, asked her to say various things in order that she might contradict them. Mrs. Thorburn also states that her girl Mary between 2;6 and 3;0 thoroughly enjoyed a game which consisted of nothing but Nannie saying 'No' and Mary shouting 'Yes' a dozen or more times, both laughing.² These seem to me best understood as examples of early playing at assertiveness: as are many little acts in these early years in which a child pretends to disobey, often with a roguish smile, or running away laughing when told to 'come here'. Rasmussen also notes that his girl at 1;8 found disobedience amusing. When discovered taking books from shelves though forbidden she laughed uproariously.³ Similarly, B at 2;3 'Screams with joy at getting hold of M's watch on her wrist, she pretending to be trying to stop him.' Such romping teasing play seems to mark a transition to playing with the impulse of pugnacity or aggressiveness which seems involved in the rough romping or fighting play which appeared in this period. For example I would turn my back and pretend not to notice, while B (about 1;8) approached and hit me; when I shouted B would run shrieking to his mother, and then the same game would be played with the mother taking my place, though his playing at being afraid of her was only very half-hearted.

Miss Shinn's niece from 1;4 to 1;9 enjoyed rough play—hitting and biting, all in good temper.⁴ She was usually so jolly and full of fun that she gives us a specially good example of this playing at aggression. Thus at 1;9 to 2;0 she would slap the

¹ See *Beyond the Pleasure Principle*, pp. 15, 16.

² *Child at Play*, p. 53.

³ *Diary of a Child's Life*, p. 28.

⁴ See her *Notes*, I, p. 195.

person holding her (in quite good temper) and once when lifted to say good night to her grandmother she snatched off her glasses and cap, threw them on the floor, did likewise to her grandfather, refused to kiss anyone good night as usual, 'laughing and romping instead'.¹ At 3 ; 3 she explicitly said it was 'good fun hitting Uncle Joe', and at the same age she stole round the family circle when all heads were bowed in prayer and gave each one a sound tap on the head with her spade!

Sometimes, however, what may appear to be such playing at a mood or emotion may really be dramatic play. Thus at 1 ; 9 B leaned against a wall and seriously pretended to cry (at nothing) and then held his horse against the wall and said 'Gee-gee ky'.

M. Etziony in his study of nursery school children noted *playing at anger* for fun. The boy J. C. (2 ; 6) played with his doll, spanking it angrily, with a clouded face and clenched teeth.² He also gives several examples of playing at fighting, which is of course a familiar phenomenon not only in children but in dogs, kittens and other animals. R. M. Yerkes reports that his chimpanzee 'Chim' loved to play at fighting him, with teeth exposed and a fighting pose assumed. Yet that this was merely play he proved repeatedly by putting a finger in Chim's mouth without hurt, as one can often do with a dog playing at fighting.³

Difficulties and dangers in the interpretation of play. In such examples just given of children's play (with strange sensations, unusual emotions, aggressiveness, &c.) there is usually an experience of a relatively novel kind, and in many cases there is also the expression in a restrained form of a fundamental impulse. It seems, however, quite unnecessary to surmise that the aggressive play of B when he hit me and ran away (as he did at 1 ; 8), or that of Miss Shinn's niece, just quoted, was really an expression of a half-repressed specific antagonism against the person concerned. Miss Shinn's niece, for example, showed similar delight at the same period (1 ; 8) in romping with a big dog, pulling his hair and tail, clutching him roughly and teasing him so that he snapped at her.⁴ Another factor that must be borne in mind in attempts to interpret the play of an infant is the child's *tendency to indulge in pure nonsense*. Things may be said and done which have no rhyme or reason, as indeed happens even among adults. An idea comes through verbal associations say: in an adult it leads to a feeble pun, in a child it may run as follows:

¹ Ibid.

² 'A Method of Studying the Character Traits of the Pre-school Child', *Jour. of Genetic Psych.*, Vol. 42, 1933, p. 191.

³ See *Chimpanzee Intelligence* by R. M. Yerkes and B. W. Learned, p. 31 (Baltimore, 1925).

⁴ Op. cit., p. 194.

After a period of a few days in which I had been drawing for B some figures and teaching him to draw a triangle and a circle, I then drew a tiger for B and said that it was going to eat a little boy. B then drew a triangle and said *that* was going to eat the little boy.

An element of absurdity of course enters into much of the dramatic play of the period. Thus Y, at 2;6, long before she went to school, when playing one day in the nursery, suddenly looked at the clock (which she could not understand) and said, 'Oh dear, it is ten o'clock, I must go to school.'¹

From 2;6 onwards 'pretence play' was frequent. But it seems unnecessary to suppose that the pretence games must always have some hidden significance. Something must be done; and often the impulse to imitate determines what. For example, both B and Y in the same period would still frequently pretend to read aloud with a book open in front of them. It is easy to read a subtle meaning into play unnecessarily. The note already quoted on B at 1;0 when he gave me an imaginary object and laughed, might have been interpreted as a first enjoyment of assertiveness and scoring off the father. But it also happened that B also played at *my* giving *him* an imaginary object: and he and Y offered imaginary food to their animals and dolls. In interpreting play as symbolic one must also remember that a very young child will make almost any thing do to represent anything else. A note on B at 2;7 describes an elaborate game in which strips of paper stood for beans; a pan in which they were cooked was placed on a fire which was represented by the blankets being piled up.

In view of the almost everyday occurrence of such pretence games, in which the simplest processes are played at in an imaginative way and often with sheer tomfoolery, it seems unnecessary to conclude that when my younger girl at 2;7 pretended her knitting needles were knives and cut imaginary slices of meat from her sister's knee and handed them round to each of us that she had repressed cannibalistic tendencies!

There are no doubt many games in which genuine innate impulses are partially expressed. I have already given examples of play at aggression and fighting: and the apparent tenderness and affection in handling dolls which both my daughters (in common with most girls) showed from about 2;0 onwards, suggested that the maternal instinct was just budding and expressing itself thus. The dolls would be ill and have to be nursed and petted, the girls would call themselves 'mummy', and so on. In such an example

¹ Dr. Lowenfeld gives some excellent examples of the enjoyment of nonsense play at later ages in the chapter on 'The Comic Element in Play' in her book *Play in Childhood*.

as the knee carving just given it appeared on the other hand that the absurdity of the play was the thing.

As generally agreed the playful indulgence in various innate tendencies is not a replica of the real thing. There is a restraint in playful pugnacious behaviour; there is rivalry rather than a real desire to hurt. Of course when there is a real motive for aggression it may appear in the midst of play without being a part of the play. Even the affectionate and good tempered Y (who was so tender to her dolls and to all animals) when playing at 2; 9 with a boy of 2; 3 began to struggle with him for the possession of his go-cart, shouting, 'I want it.'

In McDougall's discussion of play, he refers to the typical fighting play of dogs in which they carefully avoid hurting one another. This and other types of play led him to the view that such play is not really the aggressive instinct 'at work (or at play)'¹ but merely 'the primal libido or vital energy flowing not in the channels of instinct but overflowing, generating a vague appetite for movement and finding an outlet in any or all of the motor mechanisms in turn'.²

This seems to me to be a much more accurate view of infantile play than that which regards such play as a constant clue to strong innate but repressed or other unconscious tendencies. Yet it does not seem to account for the form in which these motor activities appear at times; for example, play in which very little movement (e.g. of the fingers only) is involved; and in the case of the child running away from the imaginary lion it is surely not merely the movement that he seeks, but also the excitement and emotion. In playing with her dolls the little girl seems to enjoy not only the outward procedure of looking after them, but the very emotion of tenderness—some satisfaction of the dawning parental instinct.³

In some play activities it certainly looks as though the dawning instinct causes the initiative to take place in the child, even in the absence of an appropriate stimulus: the boy hits at a friend without provocation, and the girl waxes sentimental over a most unprepossessing rag doll. In both there is, however, the realization that it is not real; the boy's pugnacity is restrained. For real

¹ *Outline of Psychology*, p. 171.

² *Op. cit.*, p. 172.

³ Professor Burt thinks that, though some sentences of McDougall do suggest that he regards the enjoyment of play as pleasure in exercising motor mechanisms, yet he (McDougall) would regard it as an emotional activity (though not due to a specific instinct) and would accept my interpretations given above. The main difference between the two views does seem to be exemplified by McDougall's statement (p. 172) that a child, in playing at ghosts, 'seeks the added energy and zest given by the element of fear', whereas I have suggested that such an emotion may be played with as a novel experience. The difference, however, may not be great.

anger and fighting, objectional resistance and annoyance is necessary. Sometimes indeed the borderline of play and reality are hard to define, as in the following report by one of my students on the evidence of pugnacity in her own childhood. She said that for several years, from 3;0 upwards, she would usually be exceedingly obedient, obeying her parents' slightest wishes. 'Then suddenly one day I would refuse to do what I had been told. I would not get up for half an hour when mother lifted me out and told me to dress. I continued to sit through a cold winter morning. Later I was whipped, but no repentance followed. Then I was good for some weeks and then came another fit. I was naughty for the sheer joy of fight.'

This report, which greatly resembles that of Miss Shinn's niece, and which is supported by similar reports that one of my own children has given me of memories of earlier years, has a bearing on the threat of old-fashioned mothers that if a child did not stop crying they would give it something to cry for!

On the other hand, the important truth in McDougall's view is one which is overlooked by some interpretations of play. We cannot assume that the specific form which the play takes implies a strong specific desire which craves for satisfaction. For example, at 2;8 Y would sometimes play at being someone else—e.g. 'Mrs. Jones' with her baby doll. Now a child's playing at being her mother has been interpreted by psycho-analysts as meaning that the little child wanted to replace her mother in the affections of her father. But the explanation seems hardly necessary when a child will play as Y did as being an unknown Mrs. Jones. At different times Y would also call herself various names of nobody in particular, insisting for a period (of perhaps a few days) on being called by that name.

Even when, as often no doubt happens, imagination in dramatic play is a means of entering more fully into some imagined experience, we cannot infer that it always implies a strong urge which craves for satisfaction. The clearest indication of this is the fact that children often play at being a horse (and not always a horse plus rider, but a horse driven by some one else), or an engine, or a motor-car.¹ Even when human beings are represented no fundamental urge seems to be necessary. For example, the interest in watching a coalheaver at work was enough to make a boy of 3½ years represent the character for a whole day, refuse to respond to any other name, and at night pray to be made a good coalheaver!²

¹ Of course some psycho-analysts, using some scores of symbols of sex, would bring many of these games under the heading of the satisfaction of unconscious desires. This will be referred to later.

² See J. Sully's *Studies of Childhood*, p. 38.

Some psycho-analysts' explanations of fantasy play seem to me to lack that touch of imagination, and at times of humour, which the children so interpreted themselves reveal.¹

No doubt in much play in which human characters are acted, some impulse is satisfied, as when the older boy plays at being a schoolmaster or 'father' and domineers over others, and when the girl plays at being 'mother' to her dolls or younger playmates. I asked one of my children of 10 years, 'Why do you like playing at being a school teacher?' The reply came at once, 'Because I like bossing people about: I want to be a school teacher.' So the satisfaction can be quite a conscious one at 10 years.

Sir Percy Nunn regards the child's habit of make-believe as 'a biological device to secure that his self-assertion during the formative years of life should not be frustrated by his inability to control the real conditions of his activities'.² This seems to me to contain a valuable suggestion and to be broadly true so far as it goes. It seems, however, that we must also regard the various forms which play takes as the consequence of the growth—the emergence into an active insurgent form—of mental capacities which crave for activity for their own sakes, as in intellectual constructive work; or as the emergence of impulses which crave for some satisfaction even in play. Whether all such imaginative play is biologically valuable seems to me to be a matter of surmise rather than proof. There seem to be some human and animal activities which are of little biological value, which appear rather to be side products, as it were, of evolution.³

Play with bodily activities leading to skilled actions, and with speech, certainly serves as a valuable part of the learning process. Playing with a doll, however, does not teach a girl much about how to bring up her offspring, though the expression of various impulses in such imaginative play may possibly be of some value in the healthy mental development of the child. We seem, however, to have no adequate grounds for urging the child to engage in make-believe play and certainly none for discouraging it. Our

¹ I should like to quote a comment by Professor Burt on this paragraph: 'Take a child trying to draw a picture of a man. His fifth or sixth effort may be so queer that he breaks into loud laughter at it. Surely it would be absurd to say with the psycho-analyst that the child's unconscious mind was deliberately trying to caricature his father in order to express his pent-up hatred. The implicit argument seems to be that the young child at this age ought to be perfectly rational in his thoughts and in his actions, and if he is not rational then he has deliberately deserted the paths of reason under the influence of some secret desire.'

² See *Education: Its Data and First Principles* (Revised ed.), p. 95.

³ I have suggested that this is true occasionally of laughter in a later chapter.

study of infant play is consistent with the view stated by Nunn, that 'Froebelian practice errs where it introduces make-believe play gratuitously, that is where the child's spontaneity does not need its aid, and the Montessorians err in refusing that aid where it would serve to widen the child's range of serious interests and achievements'.¹

I would only make the proviso that, as much of children's imaginative play is following the suggestions of other children, there would seem to be no more harm in the suggestion coming from an adult.

Symbolic and fantasy interpretations of play. After his well-known eulogy of the ball as a 'talisman' and 'moral safeguard' Froebel wisely goes on to say that it avoids the awakening of other desires by providing occupation, and it encourages activity. If we add that it gives an opportunity of exercising various kinds of skill and of competitive games, it seems unnecessary to suggest that the ball is delighted in (unconsciously) as a sex symbol, thus accounting for the great popularity of ball games! The fact that it is the only shape with which an object will move easily and rapidly along the ground so that it can be chased, and also can pass rapidly from one child to another and so on, is surely enough to explain its special popularity. (Incidentally if ball games are chiefly dependent on sex symbolism for their popularity, why is it that Rugby seems less popular with the masses than Association football, seeing that the Rugby ball seems the more accurate symbol, except to the expert anatomist?)

Play with water has also been regarded as profoundly significant because of its relationship to two natural needs of the child. Hence play with water is apt to be regarded as symbolic. A girl, it is asserted, may enjoy squirting it through a syringe as a substitute for the organ which she lacks. If a boy, it is interpreted otherwise. But surely water is a unique kind of plaything. So many things can be done with it that cannot be done with anything else; and is quicksilver any the less popular a plaything when it is available? ²

A plasticine model of a man which a boy makes and breaks up is sometimes taken to symbolize the father whom he hates and in his fancy destroys—especially if it is known that he hates his father already: such play is regarded as a release of repressions. No doubt, as said above, in the case of the dramatic play at about 3;0 or 4;0 or more, the children enjoy a feeling of superiority when playing 'mother' or 'teacher', and successful pugnacity may conceivably be enjoyed even with a fight with inanimate leaden

¹ Op. cit., p. 95.

² Dr. Lowenfeld herself gives a long list of the varied things which can be done with water as a plaything in her book, *Play in Childhood*, p. 121.

soldiers, as it is when a man who is angry finds relief in smashing something. But it does need to be stressed that the healthy alert child is constantly doing things, playing with every object that comes within his reach (beginning as a mere baby with every part of his body—fingers, nose, ear, toes, hair, as well as genitals), and later indulging in every game of movement—bumping, running, bending down, jumping, climbing stairs (a sex dream symbol); so that he is bound in time to include many activities that might be interpreted as symbolic—especially as we find over a score of objects claimed as symbols of the male sex organs and even more of the female.¹

Consider also the following records of the play of the young ape brought up by Professor Kellogg:

She would sometimes place a blanket or clothing over her shoulders and drag it round with her. She would put small branches containing foliage upon her back and similarly carry or trail them; or she would wrap herself in hanging tree moss or in rags by putting them behind her back and holding them with both hands in front. She would thereupon walk upright with a train following in her wake, towards which she would gaze with a playful smile, moving usually in a wide circle as she did so.²

Surely a sign of coyness or consciousness of sex some might say if Gua had been human; instead of which it may have been an imitation of human clothes, as similar play of a little girl might well be, or a form of play developed from random throwing things (e.g. unwanted food) over the shoulder.³

The tendency to bite things at the first appearance of teeth has been referred to as a 'quasi-destructive instinct'—and described as 'oralsadism'. It may be destructive in its effects: but the tendency to practise any new capacity can, I suggest, account for all the biting (which is chiefly of inanimate objects) which is not already accounted for by the great comfort gained for teething gums, which welcome a finger or a rubber ring impartially.

Further, in view of the way in which we have seen that imaginative play may satisfy emerging impulses and interests, we may regard as not only gratuitous but fantastic, the statement that the little girl plays with her doll as a means of reassurance, her dolls providing a 'proof that she has not been robbed of her children by her mother, that she has not had her body destroyed by her and that she is able to have children'.⁴ Incidentally such an interpretation does not seem easily reconcilable with Mrs. Klein's

¹ A list has been collected by Dr. C. S. Myers and given in the chapter on Freudian Psychology in his book *A Psychologist's Point of View*, p. 111.

² *The Ape and the Child*, by W. N. and L. A. Kellogg, p. 120 (New York, 1938).

³ The latter interpretation is suggested by Professor Burt.

⁴ M. Klein: *The Psycho-Analysis of Children*, p. 253.

own sweeping generalization that the whole of children's play is based on *masturbation* fantasies,¹ and that generalization itself is hard to reconcile with such facts, repeatedly observable in infants' play as we have seen, of the delight in new activities and new toys, of play in speech as well as with other skills, or with the rapid change in a game through imitation of others, and the great influence of recent experiences in determining play, the last a very important factor in the play of somewhat older children (5-7) as shown by some records of play with plastic material made by one of my own research students, Miss E. Hall.²

Again, to one who has watched the play of infants from their earliest months and seen all their playful activities and their meaningless movements, their practice with all kinds of sounds, and later with words, their capability of representing almost anything by almost anything else, of imagining a cake which an imaginary friend eats, and of pretending there is tea in a cup and pouring it out for a doll, the idea of requiring a psycho-analytic interpretation of the following type for a child's play is strange.

A boy of 2 ; 7 in his bath plays with his toy duck. Then he puts it in the bath near the plug hole, saying 'Duck want wee. Duck wee in hole. Duck have penis.' 'I asked him' (writes the mother) 'which was the duck's penis, and he pointed to a place on its underside and said "penis dere", but there was nothing like a penis there'. Mrs. Isaacs interprets this as 'Denial of castration anxiety'.³

A record by Dr. Lowenfeld supplies an admirable parallel.

E. J. (3 ; 6). Playing with plasticine ; her idea was to make 'pies' and 'puddings'. She told me to make several things, and insisted that a little boy in plasticine should have teeth and a tongue.⁴

Must we interpret this as a denial of tooth and tongue extraction phobia ?

It should be added that Dr. Isaacs holds that the symbolic value of play is not the sole value of play for the child. There is always, she says, the conscious and the unconscious value. She adds, however, that when a child of, say 1 ; 6, spends 'a large part of his waking time fitting things together, there can be no doubt that the cognitive activity, although present, is at a minimum'.⁵

But if the conscious value seems to provide an adequate inter-

¹ Op. cit., p. 162.

² Recorded in a thesis approved as part qualification for the M.A. Degree in Education at Birmingham University, and lodged in the University library. An Outline of the thesis is given in the *Brit. Jour. of Educ. Psych.*, 1939, Vol. IX, p. 277.

³ *Social Development in Young Children*, p. 462.

⁴ *Play in Childhood*, p. 110.

⁵ *Social Development in Young Children*, p. 211.

pretation, why read into it anything further? The assertion that there is any unconscious value must be based on entirely different evidence, particularly the psycho-analysis of the child. 'The psycho-analysis of young children', she writes, 'by Klein's play technique has shown that engines and motors and fires and lights and water and mud and animals have a profoundly symbolic meaning for them rooted in infantile phantasy.'¹

A general discussion of the interpretation of actions of children by reference to the unconscious is, of course, impossible here: it would involve a lengthy consideration of the reference back to childhood of adult experiences (a point which personally I do not regard as essential for the retention of the main values in Freud's contributions to the psychology of the unconscious).²

But we may briefly examine a sample of Mrs. Klein's technique to which Dr. Isaacs refers. In dealing with a difficult child Mrs. Klein apparently regards it as evidence of the truth of her interpretation (to the child of its play) if a child becomes friendly and trustful afterwards.³ Now a little girl, Trude (3; 9), when she first came for analysis was 'full of anxiety and ill-will'. She wanted the flowers taken out of a vase, and in her play she 'threw a little toy man out of a cart into which she had previously put him, and heaped abuse on him'. Mrs. Klein states that her 'immediate interpretation', given to the child, of this and other things 'in the sense that she desired to do away with her father's penis, because it was playing havoc with her mother (as represented by the vase and the cart . . .) at once diminished her anxiety, and she left me in a much more friendly mood than when she had come and said at home that she would like to come back to me'.⁴

But of course! Who had ever told her such entertaining fairy stories? And when the kinds of troublesome behaviour are known beforehand how easy it is to see analogies between the play and the psycho-analytic interpretation of such behaviour. The phrase 'analysis showed' is often repeated, but this seems usually to mean that such analogies were seen by the analyst and interpreted to the child. Such kind of evidence seems to me most untrustworthy.⁵

¹ Op. cit., p. 210.

² The reference back to childhood of adult neuroses depends partly on views as to infantile sexuality, the attitude to parents and the Oedipus complex which are discussed in later chapters. McDougall gives reasons for accepting much of Freud's doctrine, and yet rejecting that of the Oedipus complex in his *Outlines of Abnormal Psychology*, Chap. 25, and in his *Psycho-analysis and Social Psychology*, 1936, especially Appendix IV.

³ See her remarks on the girl Rita, in her book *The Psycho-Analysis of Children*, p. 47.

⁴ Ibid.

⁵ It must not, of course, be taken that Mrs. Klein's methods or ideas are approved by all psycho-analysts.

As a result of her treatment of problem children without such psycho-analytic interpretation, Dr. Lowenfeld bluntly states that the 'dire results of non-interpretation on psycho-analytic lines' suggested by Mrs. Klein have 'not been found to occur'.¹

Play-therapy. The significance of play in infancy has a close bearing on some recent ideas and practices in play-therapy, some of which are not in accord with psycho-analytic views. Play-therapy is used in some of our Child Guidance clinics and institutes. One main idea is that the undesirable behaviour in the child may be expressed in play form and so eliminated. Some hold that the children must be told the real significance of their play: As one play therapist put it to me, 'If a boy is aggressive towards his mother, and in the clinic hits a doll, he must be told that it is really his mother that he is hitting and wants to hit, and only then will it cure him.' The head of one of our leading clinics, however, writes, 'Sometimes the psychiatrist must interpret to the child the meaning of his play. The value of this, however, seems to be doubtful and interpretation is often unadvisable and harmful'.²

It is difficult to find any conclusive evidence for this specific value of play. Of course if one approaches the question convinced (a) that any persistent type of play always expresses some conflict or problem, and (b) that the expression in play must release any repression and resolve the conflict, that is no doubt enough. But for those not already convinced of these propositions, more objective evidence is needed.

The general value of congenial play in the development of the child is, of course, not questioned. Its value for health and happiness is obvious; and it is possible that it may serve as a stabilizer of nascent impulses and emotions. For example, as I have already suggested, though play with dolls teaches a girl very little about how to deal with a baby, the expression in such play of her own feelings may be of value to her development. Dr. Lowenfeld's summarized conclusions as to the functions of play, given at the end of her book (p. 324), seem to me to be substantially sound, though I should put her (d) 'Relaxation and Amusement' second in importance if not first except for infants.

What seems to be much more doubtful is whether violent aggressiveness say towards a father, or problems of bodily uncleanness and various neuroses can be resolved by specific forms of play. Dr. Lowenfeld's more detailed account of her therapeutic

¹ See *Proceedings of the Child Guidance Inter-Clinic Conference of Great Britain*, 1937, p. 28.

² Dr. Moodie in the Report on the London Child Guidance Clinic for 1932-3, p. 8.

methods,¹ while full of interest and marked by great candour, affords little evidence of the value of specific forms of play. In some cases she describes, the improvement takes place more rapidly when the child is away from the clinic and home on holiday (see p. 215 and of her paper, p. 213). In some cases, the length of time of the treatment gives a chance for mere maturation to have its effect. Many normal children pass through short phases of difficulty of various kinds which disappear without special play treatment.² Again, when the mother is 'temperamentally irritable with children' and 'weepy'—as was Eric C's—then merely to be away from his mother and with calm friendly people might do much.

Then there is the possible influence of any improvement in physical health while attending the clinic. Dr. Lowenfeld states that some physical conditions can 'themselves produce the whole phenomena of neurosis' (p. 196). Other general influences will be mentioned shortly.

It would seem well to await more exact information based on a comparison of the proportion of cases in the clinics permanently cured by this method as compared with the proportion cured in clinics not using this method. It is no proof to say that this method has cured some children not cured by previous treatment, because the time factor is admittedly important. As mentioned in Chapter I, one clinic director told me that some of his cases on the waiting list were reported as satisfactorily adjusted before they could be taken at the clinic.

When improvement does follow this or, indeed, any method, it is possible that it is due merely to the fact that the child finds an unwontedly friendly atmosphere, a patient and sympathetic adult, perhaps for the first time in his experience; and that he can spend much time in playing with delightful toys. (The 'World' cabinet is indeed a marvellous plaything.) Mere removal for most or part of the day from the personality (parent or teacher or sibling) with whom the trouble has been, may be itself enough—as it is with some adults who 'get on one another's nerves'. This, with the addition of calm, sympathetic, kindly treatment may be everything.

¹ See a 'New Approach to the Problems of Psycho-Neurosis in Childhood', *Brit. Jour. of Medical Psych.*, XI, 1931. It should be mentioned that Dr. Lowenfeld says that she is 'unable to accept Mrs. Klein's description of non-analytic play' (*Proceedings of Child Guidance Inter-Clinic Conference*, p. 27).

² The records of K. Bridges and other observers of 'pre-school' children afford examples of these. I noted such phases in at least three of my own children. I imagine most teachers who have had infants under their charge for several years would regard this fact as commonplace. As to the time factor, some of Dr. Lowenfeld's children attended the clinic for the greater part of a year, and some of Mrs. Klein's children paid between 200 and 300 visits to her.

Dr. Lowenfeld may well owe her clinical results chiefly to a charming personality and a winsome way with children—and so may Dr. Isaacs and other child-analysts. The effect of suggestion, too, by an individual who wins a child's affection, is often greatly underestimated or even ignored in discussions of both play-therapy and psycho-analytic treatment. The influence of suggestion looks especially likely in those cases in which improvement at the clinic is not accompanied by improvement at home. (See Dr. Lowenfeld's article, p. 205 and p. 215.)

Of Dr. Lowenfeld's patients, Susie (aged 3 ; 4), whose case is described on pp. 219–24, is perhaps the nearest to an example of a marked change after a specifically adapted kind of play. Dr. Lowenfeld for 25 minutes patiently built up rows of bricks which Susie knocked down, finally running to her mother in tears. From then progress was rapid. Yet even here the strongest impression one gets is one of Dr. Lowenfeld's great tenderness and patience with difficult children. As she herself says : 'The slightest feeling in oneself of . . . irritation . . . or impatience or lack of friendliness, and the frail bridge is broken' (p. 224).

Furthermore, the change in Susie was this : 'the centre of interest was shifted from aggression to what Susie was and was not a big enough girl to do'. Had this suggestion not been put to her ? Certainly I have found, as I imagine many parents and teachers have found, that at the right stage such a suggestion may make a most effective appeal.

The curative value of specific symbolic play seems then still very doubtful though conceivable. It is also possible that persistence in some unusual form of play may help in diagnosis. The comparative study of the play of normal and problem children of the same age with similar material and under similar conditions of freedom is, I think, a promising line of research. The chopping up of human figures made of plasticine, for example, which some psycho-analysts discuss, was found to be almost absent in the free play of the two groups of infants (over fifty in all) in the observations already referred to by Miss E. Hall, but these children were over 5 ; 0. At a younger age a child frequently breaks and pulls such material about ; and it would be unsafe to assume that occasional destructive actions at any age have any great significance. Still less can it be so interpreted when as in some play therapy destruction is actually suggested to the child—'hostility definitely activated or encouraged' as one writer puts it.¹

¹ C. Rogers in *The Clinical Treatment of the Problem Child*, p. 306. The evidence surveyed by Rogers of the curative value of play under the treatment of Dr. Levey, seems as unsatisfactory as that of Dr. Lowenfeld. For example, one boy, who after being encouraged broke up an image of a

It may be useful to give a brief summary of this chapter.

(1) If one takes play to be activity engaged in for its own sake, play seems to begin in some infants by about 0;3 or 0;4, in the repetition of movements found agreeable; about 0;6 appeared enjoyment in the constant repetition of a few speech sounds.

(2) A social aspect in play may appear about 0;6. Early appearances of social play depend on familiarity with the persons played with.

(3) New activities of many kinds are delighted in, sometimes even if very difficult; such activities may be constantly repeated for a time.

(4) Play with imaginary objects may begin at least by 1;0.

(5) From early in the second year play may often be determined by imitation of other children.

(6) Make-believe play, in the infants studied, was prominent from the second year on. All sorts of everyday activities are imitated in make-believe play.

(7) From 1;6 to 3;0 constant play with new performances continued, many of these having a period of special interest and activity.

(8) Not only new bodily activities but relatively novel sensations, emotions and impulses seem to be played with, e.g. the sensation of giddiness, the impulse of pugnacity or aggression, the emotions of fear and anger.

(9) In attempting to interpret the play of infants one must bear in mind the love of nonsense or tomfoolery, and the wide range of many play activities.

(10) The evidence for the symbolic interpretation of play-activities along psycho-analytic lines seems to be very doubtful. Often it appears to be based on coincidences between a type of play and known troubles of the child; or on an interpretation of the play based on sex-symbols, which are so numerous as to be bound to occur constantly in children's play. Play activities of the type usually quoted are capable of more reasonable interpretations.

(11) As yet there seems to be no satisfactory statistical evidence that either the psycho-analytic interpretation of their play to children or play-therapy of a specific type is more beneficial to 'problem children' than friendly treatment in a place removed from the source of their troubles. Many of the supposed cures may be due merely to maturation under such conditions.

baby (which he said was a man), asked, 'Is there anything else to pull apart?'—and himself answered 'the lady'. But may he not just have liked pulling the material about? In any case he seems to have been relatively bored by these images compared with trains, &c.

CHAPTER X

The Psychology of Imitation

Wide disagreement as to the psychology of imitation. The psychology of imitation is in a somewhat chaotic state, partly owing to the ambiguity of the term and partly owing to disagreement as to facts. At times, imitation is taken to cover the imitation of ideas and even of feelings, but more usually the term refers only to actions, and it is in this sense we shall chiefly discuss it. The imitation of ideas will be dealt with under 'Suggestion', and that of feelings under 'Sympathy', or 'Sympathetic Induction of Emotions'.

Let me first illustrate the divergence of views among leading psychologists. Thorndike¹ quotes Kirkpatrick, Stout and others as examples of upholders of a widespread view that 'the child makes every gesture that he sees and every sound that he hears': and adds that any who seem to have said that 'behaviour witnessed produces identical behaviour by any original potency' 'cannot, if possessed of any sense for fact, have meant what they said'. 'Sit before an infant', writes Thorndike, 'and perform time after time a score of such novel but simple acts as putting your right hand on your head and your left on your right shoulder. He does not in nine cases out of ten do anything more like the act you perform than like any other of the twenty.'

En revanche, Drever says: 'So much of our own learning is done by way of imitation, so much of the untutored teaching of parents, civilized and savage alike, is based on imitation, so much of the teaching and training of their young on the part of the lower animals rests on the same basis, that it is difficult to believe that Thorndike means to deny that there is an instinctive tendency to imitate, in the sense in which this has always been assumed. If he does, we cannot help regarding his view as an almost incredibly arbitrary distortion, and even flouting, of the facts, in order to support a theory which has not even simplicity to recommend it.'²

Again, J. B. Watson says that the analysis of the instinct of imitation has been only 'very superficial', and quotes Thorndike's treatment as being 'as accurate as any';³ on the other hand, J. M. Baldwin describes imitation as the 'controlling impulse' when it does develop.⁴

¹ *Educ. Psych.*, I, 110.

² *Psychology of Education*, p. 87.

³ *Psychology from the Standpoint of a Behaviourist*, p. 280.

⁴ *Mental Development in the Child and the Race*, p. 125. He refers here to 'conscious social imitation', which he did not note in his children before 0;8.

McDougall denies the existence of an instinct of imitation on the grounds that there is no 'common affective state', no common impulse seeking satisfaction in some particular change of state;¹ that we lack evidence of it in lower animals, and that cases of imitation can be explained in other ways.² Thus many cases of imitation can be explained as the result of the gregarious instinct, others can be traced to a general tendency for 'all motor representations' to realize themselves immediately in movement, an admission which it is surprising has not been seized upon by upholders of a 'general imitative tendency', as giving all they asked; for they need not necessarily tie themselves down to an 'instinct' in McDougall's sense as implying strong conative urge and a specific emotion. It is well, however, that they did not claim the authority of McDougall in their support, for in his *Outlines* McDougall shows a much more critical attitude towards this ideomotor theory, regarding it as 'an exaggeration and distortion of the truth that every cycle of mental activity tends naturally to express itself in bodily movement'.³

Rivers writes of 'unwitting' imitation as the 'motor aspect of the gregarious instinct', and suggests that this be called 'mimesis' to avoid confusion with 'witting imitation'; but it is not clear what exactly is 'unwitting'. The imitator is not unaware of the action imitated or presumably of his own action. I imagine Rivers would mean that there is no conscious intention to 'do the same' and perhaps no awareness in the imitator that his action is the same.⁴

More recently Kohler has stated that 'relatively complex proceedings seen *without a trace of insight* are not imitated' either by humans or by animals.⁵

Those psychologists I have referred to so far are, I think, fairly representative of various views in imitation. All would agree that there is such a thing as *purposive* imitation, when an individual (A) sees another (B) secure, by a certain method, an effect which A also desires, and when A proceeds to imitate the method in order also to bring about his own purpose. This is simply imitation of a means, which is comprehended as a means, to an already desired end: 'reflective imitation' I should prefer to call it (with Lloyd Morgan), in order at this stage not to exclude all purpose (in any sense of the word) from other forms of imitation.

It is in reference to the existence of a non-reflective 'impulse' or 'instinctive' tendency to imitate (*primary* imitation I propose to call it) that differences of opinion arise—whether there is a general

¹ *Social Psychology*, 9th ed., p. 103.

² *Outlines of Psychology*, pp. 173 ff.

³ *Op. cit.*, p. 290.

⁴ See *Instinct and the Unconscious*, p. 92.

⁵ *The Mentality of Apes* (Eng. trans. by E. Winter), p. 220. Reference to Koffka's treatment of imitation will be made later.

tendency, or specific tendencies, and if so, of what nature. This is obviously a question which can be answered by a thorough study of the behaviour of children in the earliest years.

In dealing with this topic I shall quote some notes on actions of the type described as 'imitation' by certain writers, though some might prefer to include certain of these phenomena under 'suggestion', 'innate sympathetic response', &c. I shall, however, not refer to self-imitation, e.g. the child's imitative repetition of a speech-sound or a new movement which he has made without intention. Stern states that this is the first form of imitation;¹ but this is not what is generally meant by imitation; and so far as it takes place we have already considered it in the chapter dealing with play, under the concept of repetitions of an action enjoyed for its own sake. Incidentally, it seems to me by no means certain that such self-imitation does always occur before imitation proper in view of the very early dates to be given now of the first appearance of genuine imitation.

Earliest appearance of imitation; sound-making at one month.
My earliest note on possible imitation is of

B. on d. 10. Look of great interest when I contorted my face, especially at a yawn, and three times he opened his mouth (only once a proper yawn) when I gaped mine open. d. 15. Suggestion of mouth opening in response to mine; but a baby's lips are so frequently moving that coincidence is always possible.

As to Y, no imitation of tongue protrusion was obtained in several tests during second and third weeks. d. 28. After half a minute, in response to nurse's talking, Y responded by 'talking' back, a slight 'ah' coming softly and always in intervals of nurse's talk in obvious reply. M tried to get some response but was too hurried. I said 'Leave intervals for Y to reply'; and then the responses came. Such responses were noted several times during this week.

As to B I noted also:

d. 32. Croons now in response to mine, five or six times repeated. In order to avoid the possibility of mere coincidence I used the following method. The number of his own spontaneous croons were counted during two minutes. Then during the next two minutes M would occasionally croon to him, with this result.

		No. of croons by B	
1st minute	No stimulus croon	8	—
2nd "	" "	5	—
3rd "	M crooning	—	12
4th "	" "	—	9
5th "	No stimulus croon	2	—
6th "	" "	0	—

¹ *Psychology of Early Childhood*, p. 90.

			No. of croons by B	
Here B began to cry for food, so test stopped.				
d. 34.	1st half-minute	No stimulus croon	0	—
	2nd "	M crooning	—	5
(Test interrupted)				

Approximate average number of croons per minute (ignoring the 6th minute of d. 32 lest desire for food was already preventing spontaneous crooning): No stimulus, $4\frac{1}{2}$; When M crooning, $10\frac{1}{2}$.

Here, then, there is a fairly clear case of one form of imitation at the age of only one month, of which other notes a few days later give further evidence.

d. 38. Guttural sound to-day, 'ar-roo', very like French *r*, not full trill. This repeated twenty times after me: I started him with cooing and he continued so fast that counting as before seemed unnecessary labour.

d. 39. Several times recently I have started him cooing ('ar-roo') when he was otherwise lying silent, and then he would go on rapidly for two or three minutes, as fast as I could reply to him, with occasional smiles.

Probably most mothers would report that they already know that such imitation takes place, but careful and repeated tests are none the less necessary.

A at the age of one month responded to sounds much less than B did, and less than Y.¹ In similar tests with A on d. 33 he gave on the average (over a six-minute test) 1 croon per minute when we were silent, and 2 croons per minute when M was crooning. This difference in so short a time might, of course, be purely accidental.

Only on d. 49 did A show very definite response to my 'ar-roo'. It started his cooing in response (with smiles), one coo to each of mine for six or seven times; and similarly on d. 51.

I am satisfied then that, in the three of my children in whose cases I looked for this imitation, there was definite imitation of sounds before the end of the 7th week, and in B and Y about the end of the 1st month. It is not imitation of specific sounds spoken, but imitation of sound-making: though one can, of course, get a similar sound made by selecting the sound 'ar-roo' or 'goo', which the infant predominantly makes at the time.

Of course, there is no suggestion that at this stage the baby makes an effort to produce a similar sound, or is even aware of

¹ In several other ways A revealed, even in the first two or three months, less responsiveness, activity or excitability than did B and others: e.g. as to his reflexes as already mentioned.

any resemblance. We are simply stating that sound-making elicits sound-making, an innate and relatively specific type of response.

The earliest other records I can find for similar imitations are as follows:

Scupin's son at 1½ months: A 'brrh' imitated with considerable exertion.¹

(I noted nothing in the nature of signs of great effort at this stage, though I did later in the imitation of words.)

K. C. Moore, d. 36, when 'talked' to, began to move his lips and make some sounds.²

Dearborn, d. 59. Being gurgled to produced laughter, then tried to repeat it and made fairly good imitation five or six times.³

Shinn, d. 59. Piano playing produced a singing murmur as long as music lasted.⁴

Stern, H. 2½ months. 'Erre' repeated 'with evident effort'.⁵

The fact that these last three observations were not made earlier I should ascribe to lack of continuous effort to elicit imitation, and of experimental tests. Miss Shirley gives 0;2 as the earliest date on which there was 'talking' back to a visiting observer among her twenty-five babies. The mother reported it earlier but she suspected this was only crooning back by the mothers.⁶ But if, as we have seen, even reflexes may depend on the social surroundings, how much more may that be true of a nascent tendency to imitate sound-making.

Smile and laughter responses. After the end of the 2nd month, and especially in the 4th month, other imitations besides those of sounds appear. Before the end of the 2nd month Y's smiles in response to a smile were so evident that I have notes as to myself and M carefully avoiding smiling to see if the mere sight of a familiar face produced a smile without a smile stimulus.

d. 81. Y, first real laugh in response to my laughter.

d. 100. B, during last week or two, if not much earlier, I believe smiles have led to smiles.

d. 115. B repeatedly laughed when his mother and I laughed to him, even when he was beginning to whimper.

This response of smiles to smiles and laughter to laughter might be held to be due to an innate tendency for a smile to cause pleasure which then expresses itself in a smile; but assuming for the time

¹ Reported by Stern, *Psychology of Early Childhood*, p. 91.

² *The Mental Development of a Child*, p. 115.

³ *Motor Sensory Development*, p. 24.

⁴ *Notes on the Development of a Child*, I, p. 123.

⁵ Op. cit., p. 91.

⁶ *The First Two Years*, Vol. II, p. 51.

being a purely behaviourist definition of imitation, and leaving distinctions till later, it should be included under imitation. It is no doubt an example of a specific innate connexion: an innate tendency to smile in response to the specific stimulus of a smile on another face.

Early imitation of movements. Scupin noticed mouth opening at 3 months when others were seen drinking.¹ McDougall noted imitation of *tongue protrusion* at 4 months. I failed to get imitation of tongue protrusion in the 2nd and 3rd months with X. With B, I tested it at 0; 5½ and noted:

d. 161. Signs of imitation, B putting out tongue when I did, and holding it out for a time; so again later. I noticed that his eyes wandered from my eyes to my tongue continually. Similarly with A (d. 173), 'but it is very difficult to know whether it was not mere coincidence'.

d. 162. On two occasions tongue put out after mine had been out perhaps half a minute; done fairly slowly, not sudden jerk (like impulsive movements), groping near mouth opening first. And often he looked at my tongue and back to eyes.

0; 6. Several times I tried to get tongue put out in imitation, but failed.

C, 0; 6. Got clear imitation of tongue protrusion. I did it five times and at the sixth time C's tongue came right to front and tip out. So at seventh and (less) at eighth or ninth. This not an habitual movement of his. Attention seemed held by my tongue after third or fourth movement.

Y at 0; 8. My tongue protrusion (and withdrawal) led to protrusion on her part (one to about a dozen of mine). She seemed very interested, trying to take hold of my tongue. Imitation again five days later.

This imitation of tongue protrusion is puzzling. As suggested above, some of the occasional observations may have been coincidences, especially Scupin's at the early age of 0; 3. But I felt confident that some of my own observations were more than coincidences, especially the slow deliberate imitations of B, d. 162, and as the baby's vision was clearly directed to my protruding tongue. How can we explain this imitation in the earliest months? There can hardly be an innate specific tendency to put out a tongue at some one doing the same. But how did the baby know what I was putting out was the part of my face corresponding to his tongue? (However, we might also ask how does a baby learn so early to look one in the eyes?) I may have made some slight sound when putting out my tongue, and if so it might be suggested that the baby recognized the tongue sound and so moved his own tongue. I am very sceptical about this idea, however (especially as regards the imitations at 6 months or earlier), and can only add

¹ Stern, *op. cit.*, p. 91.

that the strange performance remains a baffling problem. I shall refer to the topic again later.

One note of Dearborn suggests also imitation of *hand movement* during these early months. Thus :

d. 87. Imitation seems to be on the way to-day, for L immediately attempts to shake her hand when one makes this movement before her, and often with very good success. So far it is only her left hand that imitates. Her left side was consistently more precocious than her right. I have not been able to get imitation in any other action than shaking the hand.

But this observation of any imitations of movement other than that of mouth—in speech, smiling, mouth opening, or tongue protrusion—stands alone, so far as I know, before the age of 5 months : and Dearborn failed to obtain it again on the 90th day. His next reference to imitation is on d. 171, when imitative mouth movements are referred to.

Imitation of definite sounds. At 6 months imitation of other movements, e.g. arm waving, begins to appear, but only very intermittently. Before very clear imitation of outer movements is observable we get more definite advance in sound imitation, namely, the attempt to imitate a particular sound or word, and not the mere making of any sound in response to sound, a refinement of immense importance in advancing speech development. Thus :

Y, 0 ; 5½. When M was coughing, Y gave a little cough. M repeated it several times. I heard Y imitate three or four times. (Clearly not mere laughter.) The imitation followed slowly after an interval of some seconds, sounding like a deliberate effort.

Y, 0 ; 6½. I looked at her (without smiling) and began to make 'ph' explosive lip sounds : after a few Y began to imitate, her part increasing as we went on, I pausing more frequently.

B, 0 ; 7. Imitation of sound ('da-da') to-day (d. 213), on three occasions within one hour, though two or three times it failed. He had been saying 'da-da' very distinctly for two days, but these new imitations were faint whispers (very characteristic of the beginnings of deliberate imitation of language).

d. 217. When I said 'da-da' and then 'ba-ba' very emphatically to B, he looked at me with great interest, and repeated, after about five or six seconds, 'da-da' : and so four times, each time interval about five to seven seconds ; once or twice very faint whispers. This speaking seems quite different from his babbling ; it is so deliberate, suggestive of effort. But the same test failed on d. 230.

A, 0 ; 7½, d. 234. Imitated clacking noise made with my tongue last night. d. 235. Unmistakable imitation of clacking noise. Repeated series of about five noises of M's five times out of six.

Y, 0 ; 9½, d. 290. When driving in car, she imitated the electric horn (which sounds jerkily) by a harsh intermittent cough.

B, 0; 11. Repeated 'bow-wow' after us to-day: but I noticed, as often, that he does not attempt to say it as long as M goes on repeating it with only short intervals, say of two or three seconds. One has to leave longer (five seconds or more) before he will imitate.

This last comment suggests that on some occasions an important factor in imitation may be interest in the thing (sound or action). It is not a mere reflex. The child vaguely wants the sound, &c., and is satisfied if you give it. This, however, certainly does not cover all cases: for a movement is often imitated while it is still being performed by the person imitated. Cases in which it does not apply occur during this same period, namely, imitation of movements such as putting the head on one side. I suggest that the sound of the voice produces a fuller realization of the sound than the sight of, say, a head movement produces of head movement.

This imitation of specific sounds towards the end of the first year provides, of course, the essential basis for the learning of the mother tongue, and will be studied more exactly in a later chapter.

Imitation of movements: 6 to 12 months. Let us turn back to the imitation of movements other than speech.

The first suggestion is in A, at 0; 6.

A, d. 182. M was waving a handkerchief about and A showed great delight, leaning forward to watch, and then he began to wave his arms about. (This may have been merely expression of excitement.)

B, on d. 186. Very interested in my playing a harmonica. Wanted to grasp it. After one failure did so, and at once he moved his arms up and down so that the stick struck notes some ten or fifteen strokes. Later he again dropped the stick to grasp the metals, and certainly showed no tendency to strike them of his own accord later.

If the striking was done in order to produce the sound, it was the first example noted of consciously purposive (reflective) imitation: but even so it did not apparently last long.

B, 0; 7½. Failed to get him to imitate hand wave, even by waving his hand in reply to M. 0; 8½. Will still imitate readily the spinning of balls on his playground bars: apparently he will imitate simple things that interest him.

In Y there was certainly a considerable increase of imitation in the 8th and 9th month. At 0; 7½ Y learned through imitation to do 'pat-a-cake'; at 0; 9 she would put her head down sideways in imitation of another, both these things being done as responses so frequently as to put the fact of imitation beyond question. She also imitated the clapping of a friend's hands by taking hold of that friend's hands and trying to bang them together, either a case (I think the earliest) of imitating the *end* rather than the exact

movements, or of simply getting the action reproduced by the actor himself. Also she brushed her own hair with her own brush, the first correct use of a tool, whether intelligent or not.

At 0;10 Y added 'waving hands' and offering kisses, not only by making the sound but by putting her face forward; nodding and shaking head; she also imitated stretching up both arms above the head.

Y, 0;11½. After seeing a brother turning somersaults, with his head on a cushion on the floor, twice lay down, and, after laughing, put her head on the cushion.

When Y had been fed with apple from a spoon, M pretended to give some apple to a doll held by Y. Then M gave the spoon to Y, who promptly put the spoon, though the wrong end of it, to the doll's mouth.

Several new imitations were noted also in B and others at this period.

C at 0;10 and 0;11, Y at 0;11 and B at 1;0. Each when he saw me play the piano came and thumped it also.

B, 0;11½. On my knee. I raised my head towards ceiling and puffed out smoke, he imitated exactly. M timed the intervals four times between the beginning of my puffs and his responses. Times: 6 sec., 6 sec., 7 sec., 6 sec., 6 sec.

Could not get him to imitate putting up *both* arms. He simply put up one, the right, even though I several times put up his left arm also (a departure for once, as an experiment, from the rule of not trying to get the child to imitate).

B, 1;0. When he heard and saw me playing the piano he came and thumped the bass notes. (This, of course, might be purposive.)

d. 371. Did not attempt to copy head shaking. d. 375. Noticed head shaking to-day, but he would not do it in imitation.

B, 1;0½. Saw me and M kissing several times. Suddenly put his face forward and put lips to M's face and made kissing noises. Does not readily imitate my smoking now or throwing back head: has not done it to-night at all, though I tried to make him, by repeating the puffing in his sight.

B, 1;3½. He still imitates my puffing (smoking), so imitation of action goes on apparently as long as action interests.

A, 1;1. Copies me putting my head back to 'puff' in smoking, and has done so several days.

This imitation of smoking, puffing and putting back the head, is hard to reconcile with the view that primary imitation is confined to actions prompted by specific instincts.¹ Of course, the separate actions of putting the head back and of puffing are sometimes done spontaneously, but the *ensemble* is not an instinctive or

¹ Cf. Washburn, *Animal Mind*, p. 238.

innate activity.¹ Nor is it purposive—a seen means of accomplishing a desired end: and this is still more evident in the imitation of reading at 14 months. Thus Y frequently in this 15th month put her face close to a book and made soft mutterings, as though imitating others reading aloud: so also

B, 1; 8. Imitated reading this evening. Sat on floor with book on floor and put his face close to it, moving his head across it as if reading.

These supplement the observation of a considerable number of imitations which can hardly be regarded as 'purposive', or involving any 'insight', such as crooning, tongue protrusion, mouth gaping, leaning head on one side, hand waving, all occurring before or about the end of the first year. To these we must now add puffing and reading aloud. Such spontaneous imitations are clearly distinguishable from others in which, now that the child of one year can understand more of the wishes of others, he can be urged to imitate, as the following note on Y illustrates.

Y, 1; 0½. To my amazement I was told that the nurse had taught Y to wink. I was sceptical. Y was brought and at M's command and example winked definitely with the left eye several times: and so later, in response to my winks, without any command. Sometimes the right eye-lid also moved: but several times I have to-day seen a distinct closing of the left eye without movement of the right eye-lid.

This imitation of winking was frequently noted on the succeeding days; undoubtedly it then became associated with the laughter she thus caused and which she evidently enjoyed, so that within a day or two she winked spontaneously. Such imitations of winking, I imagine, will not be regarded as 'instinctive' and, I hope, not at this age as 'involving insight'. In this case, however, as the imitatee was the nurse, we cannot be sure that Y, though only a year old, did not understand that she was desired to do what was being done, even on the first occasions. She certainly did when I observed her.

¹ This seems to rule it out from the more primitive type of imitation which Professor Nunn included under 'Mimesis'—the response of a 'train of activity already prepared'—with its corresponding 'engram complex', only needing the sight of such activity in another to set it off: whereas Nunn's second type of imitation involves 'conscious intention'—and also the co-operation of intelligence in the carrying out of the movement. But examples given in this chapter suggest that there is a form in which there is conscious intention to imitate an action which is already easily performed and with an innate tendency behind it. For Nunn's views see his *Education: Its Data and First Principles*, Chap. X. J. M. Baldwin recognizes a simple sensory-motor reaction without 'conscious purpose', a form of 'simple' imitation which he treats under the heading of Suggestion. See *Mental Development in the Child and the Race*, pp. 279-80, and Chap. VI.

There is no doubt that at this early stage of, say, 12 to 15 months, one thing will be imitated and another not, without any very obvious explanation. My notes naturally tend to give more frequently cases of imitation : cases of non-imitation were occurring, of course, daily. But none of the notes reveal failures to imitate actions one might have thought likely to be imitated.

A child cannot, of course, imitate an action when the action is so complicated or so remote from his previous actions that it would be almost an entirely new one for him. New combinations and slight modifications can be made, as when 'dad-dad' was said (repeatedly) in imitation, when previously only 'dad' has been uttered. Mere ability, however, does not ensure imitation ; for sometimes an action, which is done at times spontaneously, will not be imitated. (See note d. 375 above.) One would hardly have thought it necessary to call attention to the fact that a child does not always imitate an action which he can do, had not Koffka stated that the 'compulsion to imitate' actually arises from the ability to imitate.¹

So far, then, up to the period of about one year, we can trace a number of individual tendencies of a primary, impulsive type, not implying conscious purposive imitation. Such tendencies to imitate specific actions, no doubt, vary greatly in different individuals, but in none do we find a general tendency to imitate anything and everything. Nor are the actions imitated always instinctive in themselves (as, for example, reading, or puffing smoke). They are all *interesting*, otherwise the child would not observe them ; but not all interesting actions are imitated.

Some actions, I think, are not imitated because they are already done for a purpose, are definitely associated with that purpose, and only used when that purpose is in mind. This, I think, is the explanation of B's failure to imitate head shaking at about 1; 1½, when he readily imitated other actions. Also, though Y learned about the same age to shake her head intelligently (i.e. when she apparently realized she must not have something), I

¹ *Growth of the Mind* (Eng. trans.), p. 317. Koffka in his treatment of imitation seems primarily concerned with what appears to me another issue entirely. 'The problem of imitation', he writes (p. 316), 'has thus been reduced to a very general problem of configuration ; namely, how any perception can issue in movement.' Then later : 'of course it is important to realize that a compulsion to imitate also exists, but this should be understood as something which arises from ability to imitate.' Koffka's apparent view that children only imitate actions which they understand (p. 318) seems contradicted by imitation of such things as smoking and reading aloud and a number of the actions described above ; but Koffka's treatment here of imitation seems to me lacking that fine clarity which marks his spoken exposition.

find no note of her imitating the head-shake *in vacuo*. And in the series of thirty-eight imitation tests described later, head-shaking, nodding, and hand-waving (good-bye) which had acquired definite meaning, were almost the only actions not imitated.

The latent period and the effect of repetition. Some new aspects appear in imitation shortly after 12 months. Thus the *memory* of a seen action may produce imitation. This was noted in

Y at 1; 0½ when crawling round the room on seeing me open my mouth wide several times, she waggled her hand at me in annoyance and crawled rapidly away, but as she came round the back of my chair, I noted she was repeatedly opening her mouth wide.

B, 1; 1½. When given a piece of clean paper, he took pencil which he had been playing with and made marks, remembering apparently the last time I did it, perhaps two weeks ago.

Y, 1; 0½. In middle of slight 'grousing' to-day when she had dropped a tin box she was playing with I heard a distinct 'ta' sound. This had not been said to her, by any one just before, in fact no one was talking to her. Probably twenty-four hours had passed since she had heard 'ta'.

At a later stage the deferred imitation of speech sounds are frequent. Other examples of the latent period in movement imitations will appear in the record of the experiments given later. Cases occur more frequently at later ages, e.g.:

B, 2; 4. Would not imitate J. M. in a somersault yesterday; M says he seemed frightened at her suggesting he should. But this morning he spontaneously tried it at considerable risk.

The occasional need for repetition of stimulus is also seen in B.

B, 1; 3. M noted B imitated my feeding his toy donkey. I had held spoon to donkey's mouth and smacked my lips, and he did the same. I have been 'feeding' his toys to make him take his food for over a week, but he has only begun to imitate the last day or two. B readily imitated M, raising arms above head and stretching, but more completely after she had repeated it several times, i.e. though novelty, no doubt, has its influence, there seems to be some weight due to repetition; the idea is impressed by that—repetition at first seems to increase interest, as indeed it may in the adult, for example, in the sphere of music, and even in pictorial art.

The need for repetition will also be illustrated in some of the tests upon Y described later (e.g. No. 33). It may be regarded sometimes as a necessity if the act is to be apprehended sufficiently for imitation. Or sometimes it may be that the action is made interesting chiefly through repetition and recognition.

Summary of evidence up to 12 months and suggestions of a theory of imitation. It may be convenient at this stage to sum up the

evidence we have up to the period of about a year or a year and a quarter, and to sketch a view of the nature of imitation apart from purposive imitation of a *means* with a view to some other *end*. Before 2 months, at an age long before purposive imitation can be imagined possible, we find clear evidence of specific forms of imitation. The earliest is the imitation of sound-making, developing later into more and more close imitation of the actual words spoken. By 0;3 to 0;4 smiles and laughter are responded to with smiles or laughter. Before 6 months, the curious phenomenon of imitated tongue protrusion was certainly observed.

Between 0;6 and 1;0 we find broader movements imitated, requiring muscular co-ordination learned by experience, as, for example, waving hands, putting head on one side, 'smoking', making kissing noise, and winking. These imitations are all alike in that they are not done as a means to an end of which they are perceived to be the means.

They differ in that: (1) some are actions to which there is a strong pre-existing, innate, specific, possibly instinctive, tendency: as, for example, babbling, smiling and laughing; while (2) some are actions towards which we cannot suppose there is any specific tendency as, for example, 'smoking', 'winking' and 'reading'.

Some psychologists would not classify the smile response under imitation, but would say that this is an innate expression of feeling, that feeling itself being called forth by a similar expression by another. Others would remove from the list of imitations the speech response—saying that this is the result of the association of the child's own speech utterance with the sound of it; that sound-making is a natural, spontaneous impulse, and that the utterance of a sound on hearing it is an example of ideo-motor activity, i.e. that the mere idea of an action tends, in the absence of inhibiting influences, to result in the action being performed.

But neither of these objections seems to justify the entire separation of these from types of early imitation. It is true that the smile response is peculiar in that it probably has a special feeling attached (though we do not know that the others have not at this stage) and is of such social importance as to justify individual consideration as a specific innate tendency. And the latter is true also of the imitation of sound-making. The reference to the ideo-motor theory, as we shall see, is nearer the truth, though it cannot be accepted as universally true¹; but most, if not all, forms of early imitation might similarly be labelled. The imitation of sound, it may be suggested, is peculiar in that if it had not been for spontaneous speech causing hearing of sound, the subsequent hearing of sound would not have brought about the speech. Certainly

¹ See McDougall's *Outlines*, p. 290

spontaneous speech shows the infant how to do it when the impulse comes to imitate ; but spontaneous movements of hand and head, &c., similarly prepare the way for the imitation of such and more complex movements.

We may accept with McDougall the view that some imitations are due to, or at least closely connected with, the gregarious instinct : though it would in my opinion be better to limit the gregarious instinct definitely to the impulse to get *among* one's fellows, and then further admit a tendency to imitate them in many actions, a tendency also biologically useful.

We may also admit with Thorndike : (i) an original attentiveness of man to the acts and sounds of others ; and (ii) the ' original satisfyingness of the approval so often got by doing what other men do '.¹ Yet we cannot infer from these the absence of imitative impulses. Indeed, these principles of Thorndike surely go some way towards supplying the foundations of even a *general* tendency towards imitation, which seems contrary to facts, and which Thorndike himself denies.

We cannot, I think, find *one* formal definition of imitation or one formula to cover all cases. The problem is partly one of exact defining of terms, rendered more difficult by the rich complexity of human nature, and especially by the over-determination of many actions by several motives blended, and by the tendency for nature to avoid sudden jumps. My own conclusions at this stage I may sum up here briefly, giving a preliminary grouping of types of imitative response.

It may first be admitted that there is no general tendency to imitate anything and everything, seen or heard. An infant is constantly being presented with examples of possible actions which he does not imitate, and to which he does not even attend except momentarily.

As to positive tendencies :

(i) There are specially strong innate tendencies to imitate certain specific things, which are necessary or useful for social intercourse, e.g. expressions of feeling, such as smiling and crying ; and speech-sounds. We might call this *Responsive Imitation*.

(ii) There is a strong tendency to imitate when the action seen appeals to some pre-existing innate impulse, provided the situation of the moment is not unsuitable for it to be called forth. The examples of this chiefly comes at a later stage than the first year. The cases overlap somewhat with the preceding type (i) : there is, for example, a strong spontaneous tendency to babble and perhaps also to smile ; but the former greatly declines in deaf children and the faces of the blind are well known to become less

¹ Op. cit., p. 117.

expressionful. We may label this *Suggestion-Imitation*. Lloyd Morgan noted that though chicks have an instinctive tendency to scratch the ground, they do it earlier if they see the mother hen scratching. The sight acts as a suggestion to the latent impulse.¹

Many imitations, however, cannot come under (i) and (ii) above. There is no 'strong innate tendency' to throw the head back and puff as in smoking or to wink or to read aloud, nor is there a special social value in such imitations. But they, and other actions like them, would be curious actions to a little child, and they are obviously very interesting to him.

Now the imitation in such cases may be one of two types.

(iii) First it may be *the issuing into action of an idea very vividly conceived, which monopolizes attention for the moment*—as the phenomena of hypnotism are usually explained, and as may occur even in adults. For example, a snapshot I took of a high jump at some college sports reveals the Principal of the College standing near the bar, with bended knees, unconsciously imitating the jumper. With the restricted range of attention of infants it is natural to suppose that such monopolization of the whole field of attention will very frequently occur. This type does seem to approximate to *Ideo-Motor Imitation*, and with certain additions as in (i) and (ii) above, and (iv) below, it seems to cover all types of imitation except (v) below.

(iv) A second type to which such imitations may conform is one in which *actual imitation of the action serves the purpose of making the action more vividly realized*. This type again may be found in adult behaviour. For example, I sometimes find myself, in reading a vivid description of a character in fiction, imitating some mannerism or action of feature described. This theory fits in readily with many of the observed facts.² At a later date B and Y imitated actions of things seen in pictures and also actions described in stories, as they were told to them. We might distinguish this type by calling it *Imaginative Imitation*.

In both (iii) and (iv) the imitation will tend to follow, naturally, only when the child can already perform an action resembling fairly well the seen action. But they are neither of them of a type which necessitates the actions imitated, being, as one writer

¹ See M. F. Washburn, *The Animal Mind*, p. 238 (New York, 1908).

² Stout discusses this 'fuller realization' interpretation of imitation and gives a large place to it (*Manual of Psychology*, Book III, Chap. 3). I had independently, as I fancied, drawn the conclusion, from observation of my children, that early imitation was frequently of this type. Then, on re-reading after many years Stout's chapter on Imitation, just before concluding this paper, I found, as I have done before, that an idea I imagined had arisen spontaneously in my mind was contained in that comprehensive book by my former teacher and colleague.

says (following Kohler) 'of a type already thoroughly familiar and completely understood'. Indeed, it is for the very purpose of understanding more fully something novel, that some actions of the type of (iv) seem to be imitated.

(v) Imitations of actions which almost seem of a *reflex type* very similar to number (i) above (Responsive Imitation) but more resembling a reflex. The tendency to yawn at the sight of a yawn, or cough when one hears others cough, is well known. Here is a reflex responding to a perceived occurrence of the reflex in another, not surprising when we reflect that the flow of saliva at the thought of food affords an example of the stimulation of a reflex even by a thought. One or two examples of imitation given above seem to be of this type, possibly including the protrusion of the tongue.¹ The latter might be regarded as the imitation of a very interesting action; for the infants certainly seemed fascinated by it. But it occurred at so early an age, that one can hardly imagine the child in any sense knowing that the protruding tongue corresponds to *his* tongue. If, however, they are of a reflex type, the puzzling thing is to account for their existence by any degree of utility. Still, it may well be that nature is constantly throwing out experiments, as it were, in the fixating of movements as reflexes or instincts; that they appear fleetingly and not in all individuals and, if not of use, finally disappear, not only in the course of the life of the individual, but eventually from the race.

Can we find some common aspect in these five groups or in some of them. I think we can. *In all four cases under (i), (ii), (iii) and (iv) above (and sometimes (v)) we may infer a strong interest in the action imitated.* The action which corresponds to some 'pre-existing natural impulse' is, no doubt, found specially interesting for that very reason, just as one aspect of an instinct is a tendency to be interested in and attend to certain things which provide a stimulus to the conative impulse of the instinct. In this respect imitative impulses resemble instincts, but differ from them in that the former have more general conditions for their stimulation. The type mentioned under (i) above (*viz.* smiling and speech) seems to be fairly specific as regards stimuli, but it is only as regards its special strength and invariability that the reaction is differentiated from imitative reactions to other, more general or varying stimuli. Finally, the type given under (iv)—(imitation to realize an action more vividly) seems to involve a purpose; but it is not suggested that this is a deliberate and fully self-conscious purpose. Even when I detect myself imitating a mannerism of a character in a book I am reading, I realize that

¹ McDougall here applies the term 'extremely simple rudimentary instinct' (*Social Psychology*, p. 106).

it is not done after conscious decision to act for the purpose. It seems to come as a result of a slight fascination by the nature of the mannerisms, and the consequent imitation enables me to realize the situation better without my having willed that it should.

Still more, in the case of children imitating actions described in stories and pictures, it would seem quite wrong to imagine that at, say, 2 years of age, the child consciously decides to imitate in order to realize a story more vividly. There is first, I suggest, the impulse to imitate an action which fascinates him—monopolizes his attention—and then the added vividness of realization emphasizes this tendency in much the same way as a process in learning by 'trial and error' is 'stamped in' by success.

In all the various types, then, most of the imitations are imitations of an action which monopolizes the attention for the moment, interest being sometimes secured through novelty of the action seen, or a strong liking for, or admiration of, the agent, a point which will be demonstrated in some experiments described later. The imitative tendency at times, however, seems primarily due to a strong pre-existing innate tendency to perform the action seen; and in these cases, especially those of the 'suggestion imitation' and the reflex type, attention to the seen action may be only fleeting.

It will be seen that we have arrived now at a view of primary imitation very similar in its central element to one aspect of McDougall's view, expressed in his *Social Psychology*, but to which he seems to attach less importance in his later *Outline of Psychology*.

As regards Thorndike's view, if we emphasize in all these types of imitation the impulse to a similar kind of activity, rather than the *exact* copying of a series of movements (which latter, as Thorndike points out, is far from being the case), we shall avoid one of the main objections which Thorndike himself brings against the view that a tendency to imitate exists, on the ground that many imitations of actions are learned. He writes: 'Of course, after he (the child) has performed many acts as segments of many situations, the latter including often the perception or idea of the act, you may frequently, by performing an act, get him to perform it also. But his act is then a result of learning, not of instinct.'¹

True, 'learning' explains the exactness of the copy, but it does not explain the *impulse* to imitate, unless we approve (and surely Thorndike would not) of Koffka's dictum, already quoted, that the ability to do *x* *prompts* imitation of *x*. It is not indeed necessary for Thorndike to hold this in order to maintain his main positive

¹ *Educ. Psych.*, I, 110.

assertion as to imitation; namely, that there are certain 'probable cases' of 'production, by behaviour witnessed, of similar behaviour'.

Later we shall come across two further types of imitation—which we shall call 'Gregarious Imitation' and 'Self-abasement Imitation'.

Experiments on imitation at 12 months. I will give now an account of a series of tests, made on Y at 1;0½, to see if further light could be obtained on the question of a specific tendency to imitate. The tests illustrate further some of the points I have touched on. In the second column it is stated whether the particular action had been previously done by Y, either spontaneously or in imitation. If known to have been done, it is important as proving the capacity to do it, and the lack of entire novelty. It is essential in such tests of imitation that nothing should be said to the child urging him to do the same, and that he should not have a single word of praise for imitating. Unless otherwise stated, the action to be imitated was done by myself.

Tests of imitation on Y, between 1;0½ and 1;1

<i>Nature of action done in front of Y</i>	<i>Whether previously done by Y, spontaneously or in imitation</i>	<i>Result</i>
Test 1 Putting two hands above head, held straight up	Occasionally puts hands to top of head	No effect at first; beckoned for her supper. When a little of this taken, suddenly put both hands up (without further demonstration), and so repeated. Suggestions of this latent period appear in other tests also
Test 2 S ¹ sat on floor in front of Y and banged floor with foot	Not definitely re- corded, but almost certainly done spon- taneously	Y watched with apparent in- terest. After a few shuffles and smiles a foot banged; first left foot and later right, and so several times
Test 3 Kissing noise made	Learned by imitation and now often done spontaneously	Kissing responses after three of mine
Test 4 Building up three bricks	Never done before, though Y must have seen bricks being built up	Seemed interested, but only banged bricks together
Test 5 M knelt and put her head on ground three or four times	Never, but has imi- tated C doing somersaults	Laughed at M and watched with interest but no imita- tion. M repeated, no imita- tion

¹ S here, as elsewhere, stands for 'Sibling'—a brother or sister of the child concerned.

<i>Nature of action done in front of Y</i>	<i>Whether previously done by Y, spontaneously or in imitation</i>	<i>Result</i>
Test 6 I put my watch to her ear till she heard the tick (and smiled). Then I put watch in her hand	Tested several times during last month or two, without result	When watch put into her hands the second time she put it to her cheek just under same ear (L.). Held it out to S and made clicking noise. Later put to my face; no effort to get it near my ear
Test 7 I opened my mouth wide to her	Tested once at least before. Signs of annoyance had then followed, she banging her hand to and fro at my mouth	Hand waved to and fro at my mouth (as when angry) but then her mouth opened wide; so several times
Test 8 I tore a newspaper several times and then gave it to her	Done months ago, but not recently so far as known	Tried to pull at newspaper, but no tear
Test 9 Putting on a hat	Done months ago, but not recently	Tried to put hat on her own head; first time did not manage, did not try again. <i>N.B.</i> —Major's child of 12 months tried to put hat on Major (op. cit., p. 134)
Test 10 Head-shaking	Often done	(i) No result; (ii) No result
<i>N.B.</i> —Tests 10 and 11 already mean something definite, and are fully 'realized'.		
Test 11 Head-nodding	Often done	(i) No result; (ii) No result
Test 12 Arms held by M at right angles at elbow	New	Imitated (report by M)
Test 13 Knocking over column of bricks	Last seen done by me, three or four days ago at least	When fourth brick put on and my hands away she approached her finger tip gently (as though pointing) and pushed column over. (This may have been in order to hear the bang.) This not repeated though when I built column again
Test 14 Building bricks (four bricks)	Shown several times before but no imitation. (Last time about a week ago)	At once this time put second brick on first and tried to put third on but it fell. So again just afterwards
Test 15 Putting cork in big ink bottle	New, so far as I know	When I took the cork out and then put it in front of her, she immediately tried to fix it in again but did not succeed; second attempt—offered it to me; third, attempted to put it in, then took cork to mouth. Looked at my face at once when she had done it

<i>Nature of action done in front of Y</i>	<i>Whether previously done by Y, spontaneously or in imitation</i>	<i>Result</i>
Test 16 Gave her three bricks (to see if deferred imitation shown)	See test 14—which was given five days ago	At once tried to put second brick on first; succeeded after several futile attempts. After succeeding crawled away. When called back and three bricks again put on carpet separately, she put second on first and then tried to add third
Test 17 With no intention of test I was shak- ing my finger at S, who was hold- ing Y, telling him something to re- member	Never done before, though of course she may have seen such pointing	M suddenly noted Y was pointing finger and wagging it somewhat similarly. M did the same; Y turned to S and wagged her finger to him and seemed satisfied only when he joined in
Test 18 Hand-wave	Frequent: it already has a meaning for her	No imitation, but offered hand to shake
Test 19 Head-shake (No)	Ditto	Imitated with a smile
Test 20 Head-nod (Yes)	Ditto	Imitated with a smile
Test 21 Two hands over head	New, so far as known	No imitation, but very busy with a toy
Test 22 As 21, on M's knee, no toy	—	Imitated this time
Test 23 Put waste paper basket over my head	New, so far as known	When I put open end towards her, she took hold of each side and bent her head down, slightly inside basket (too heavy to lift up). So again second time; but then it ceased to interest her and she made off for papers on floor
Test 24 M rubbing cream into her own hands (not de- liberate test)	New, so far as known	Movements clearly imitated
Test 25 I opened my mouth wide, facing Y	See test 7	Opened her mouth (twice) and put first finger in as though pointing. Later simply gaped at me twice
Test 26 When Y imitated M's putting head on one side, I called her attention to me and did the same	Often imitated before	No imitation of me followed. But again Y imitated M. Then again no imitation of me. Again imitated M. Then again no imitation of me

<i>Nature of action done in front of Y</i>	<i>Whether previously done by Y, spontaneously or in imitation</i>	<i>Result</i>
Test 27 S twanged toy violin and threw it down (not a deliberate test)	Probably played with before	Seized violin and pulled its strings; purposive imitation here?
Test 28 Scratched my head	Done spontaneously, no doubt	Hands up to head and slow scratching movement
Test 29 M bobbed up and down, doing physical exercises	New, so far as M concerned	Y laughed and began to bob up and down similarly. So later when I did similar exercises
Test 30 M was airing garment in front of the stove (not done as test)	No doubt seen occasionally; never done	Y went and took another garment, toddled to stove and solemnly held it in front of stove like M
Test 31 Said 'ta' to her, nothing being offered	Often tried. Never had imitation followed. But last night it had been whispered after giving of toy, and later had been practised by her and twice shouted	Imitated at once, softly whispered, but very clear
Test 32 M took a hand-mirror and patted it, then gave to Y	Certainly new	Y took mirror and at once patted it several times, and then gazed into it. Notable that she patted it first because the right side was towards her
Test 33 (a) Still trying to get something she would not imitate, I took a book, put it on the floor and put kettle lid on it	Certainly new	(a) Lid lifted and thrown behind. Book played with
(b) Test repeated	—	(b) Same result as before
(c) Test repeated	—	(c) Lid now taken and placed steadily on book. (Again effect of repetition?)
(d) Test repeated	—	(d) Book opened and lid put inside. She had just found slip of paper inside and tried to replace it and attempted to close book
Test 34 M doing 'Peter works with one hammer,' then two and three, working finally two hands, two feet and head	Quite new	Laughter. Then one hand lifted and waved and one leg lifted (as she sat on floor) and held aloft. No movement of head

Name of action done in front of Y	Whether previously done by Y, spontaneously or in imitation	Result
Test 35 Y sitting in cot. I rested my chin on top side	New	Stuck out her chin in same attitude and comically like expression but not on rail : and so three times
Test 36 M had chin on hand (not done as test)	—	Put her hand to chin in exactly the same way
Test 37 M doing exercises, arms extended, hands gyrated at wrist (not done as test)	Seen a number of times	Y repeatedly imitated and now does the action easily

It will be seen that in 31 out of 37 tests there was imitation ; and in several of the negative cases there was a good reason for the absence of imitation. Thus in test 21, Y was busily occupied with a toy ; when she was without a toy, the same test, 22, was successful. In tests 10, 11 and 18 the nodding and shaking of the head and the hand-moving had already acquired a meaning for the child ; and it is likely that she would be disinclined to do these things when she was not ' thinking ' their mental correlate at the time.¹ Apart from these four tests, the only failure to imitate was in test 5, and test 4—the building up of three bricks—which may have been beyond her capacity at the time, and to which the banging of the bricks may be considered some approach. I may add that about half-way through this series I asked several other members of the household to suggest things that Y would be likely *not* to imitate, but within her capacity. Yet we failed to find anything.

Now none of these imitations (with one exception) could be considered ' reflective ' (consciously purposive) or done with ' insight ' into any value or end. There may, no doubt, be in some a satisfaction in doing a novel thing (e.g. test 15). But that is, I suggest, an aspect of one of the types of imitation given above.

It is possible there was more imitation by Y than by any other of my children, though I cannot be sure that the others were less imitative (especially B and X) in the absence of series of exact tests.

Gesell's tests might be taken as showing that, provided the action is sufficiently novel and interesting, the majority of the children he tested at 1 ; 0 and 1 ; 6 would imitate the action. Thus about three-quarters of the children of 1 ; 0 imitated the shaking of a little hand-bell ; a similar proportion at 1 ; 6 imitated the hitting

¹ Cf. Dr. T. Ischikawa's remark that the growth of association paths makes imitation harder. *Beobachtungen über die geistige Entwicklung eines Kindes*, p. 34 (Beyer and Söhne, 1910).

of a doll that whistled, and the building up of three bricks.¹ But in the first two tests at least it might reasonably be argued that the action was performed in order to produce the pleasing noise.

Lest Y, however, might be considered quite exceptional in her tendency to imitate a great variety of things some of which do not seem very interesting, I gave a colleague the list of tests given above and he kindly undertook to apply them to his boy, aged 1; 10. This colleague, I may add, is a competent psychologist, with training and considerable experience in experimental work and in testing young children. I give below a summary of the results.²

Experiments on imitation at about 2; 0. All but 4 of my 37 tests were given by Mr. Chapman. Out of the 33 done, 25 were imitated—in two cases with a latent interval. Of the 8 in which no imitation followed:

(a) Two were the 'head-shaking' (meaning 'No'). In the first of them the child 'looked puzzled—stopped playing with book and pointed to bricks, no doubt taking the head-shaking as meaning prohibition'. In the second case also he looked puzzled.

(b) One was the head-nodding—'the child turned to his toys laughing'.

(c) One was the hand-wave—'which has a meaning—the child said "No"'.

(d) One was the saying of 'ta' (No. 31), which was not imitated but *obeyed*, the child offering the toy he was playing with.

This leaves only three cases of failure to imitate when the stimulus did not *mean* something, viz. Nos. 28, 32 (in which the mirror was wisely looked into instead of being patted) and 36, which might be regarded as too commonplace an action to be interesting at 1; 10.

Before the experiments were done on Mr. Chapman's boy I was anxious to see if the strong tendency to imitate was still present in Y to the same degree at 2 years of age. So most of the tests given at one year were repeated on Y at 2; 0½ in a series extending over three months.

In these I also tested the influence of the person imitated. It will be noted that, in one or two of the first series of tests at one year, Y only imitated when her *mother* performed the action. In this second test series I sometimes arranged that others should first perform the action and then, if no imitation followed, her mother (M) repeated the action. The number of each test indicates which test it was in the earlier series.

¹ See *The Mental Growth of the Pre-School Child*, pp. 107-9.

² My thanks are due to Mr. A. E. Chapman for so carefully carrying out these tests.

Experiments of imitation on Y at 2;0 to 2;3½

No. of test and person doing it	Result
1 (i) S ¹	No imitation
(ii) F	No imitation
(iii) M	Imitated
2 M	Imitated
3 M	Got up and kissed M. When M persisted, said 'Don't do that,' then got up and kissed her again
4 S	Imitated
5 M	Imitated
6 F	Imitated
7 F	Looked at me silently
S	Said 'Don't'—so several times
M	Said 'No, mummy'—then her mouth gaped open and so a second and third time
8 M	Took torn paper but no further tearing
9 M	Imitated
10 M	Laughter
11 M (head-nodding)	'Don't do that,' repeatedly
12 S	Imitated
18 S (hand-move)	No imitation
M	No imitation
23 S	Imitated
25 F	Said 'Funny Daddy—Mummy do it,' then did it herself
29 M	Imitated
34 M	Ditto
36 M	Ditto
40 Arms stretched up, F	Looked and said 'Mummy do it'
Arms stretched up, M	Y now put her own arms up
41 S opened mouth to show throat to M	Imitated ²
42 F lay on back and did leg exercise	Amused and said 'Look, Mummy,' but no imitation
M lay on back and did leg exercise	Imitated
43 M lay back on floor	Imitated
44 M was sitting on floor with hands clasped on knees	Imitated, with some difficulty
45 Miss G., living in the house and well known to Y, put two bricks on her own head	No imitation, Y puts bricks back in box
M did the same	Imitated
46 F puts a brick on his foot	Y goes on packing up bricks, which she is eagerly enjoying
M puts a brick on his foot	Packing continued
47 Miss G. put a brick on her own head	Imitated

¹ S throughout stands for Sibling and is used when the use of the usual letter might indicate the relative ages of the children. In these experiments, as elsewhere, F means the father.

² This gaping open of the mouth seemed to have a peculiar fascination for Y. She shuddered at it—but imitated, at about 12 months. She imitates again after protest at 2 years; and as late as 3½ years, when I stood in front of a loud speaker when a speech was being broadcasted, and opened my mouth as though I were the speaker, she watched earnestly and then opened wide her own mouth.

the imitator also desires.¹ It is difficult to find before about 15 months cases of undoubted rational purposive imitation. Major says purposive imitation appeared in his child before 1;0,² but he seems to mean here by 'purposive', voluntary rather than reflex: for later (p. 140) he says that acts imitated as useful for a desired end only came at the beginning of the 3rd year.

The first note of imitation by B which conceivably gives an example of purposive imitation is at the end of the 1st year.

B, 0; 11½ had big pencil in his hand; I moved his arm so that the pencil hit the cup and made a ringing sound. This evidently pleased him and he now imitated the movement enough to make the pencil touch the cup but not to produce the sound, or to hit repeatedly; and so later, though I put him through the movement for three series of five or six hits each.

The next possible example of purposive imitation by B given in my notes is when he made marks on paper on being given a pencil, after seeing me do it some two weeks before. But it is not certain that even this was done with a view to making the marks: and Y imitated scratching on paper with a pencil at 0; 11 with no signs of looking for any marks afterwards. Another doubtful example of rational imitation was at 1; 4 when B would put his hand to the handle of the door when he wanted to go out. This going to seize the door handle at 1; 4 by B was partially anticipated by Y at 1; 0½, for when being carried to the door to go out she would bend down to seize the door handle. As she did not go to the door herself and do this as B did, it is still more uncertain whether there was any realization of causal connexion—any imitating of means in order to bring about a desired end, the true mark of purposive imitation. The difficulty of deciding on the occurrence of a rational or purposive imitation led me to devise some special experiments on Y at the age of 1; 1. The first was as follows:

Experiment 1. on Purposive Imitation of means to a desired end. I placed two rosy apples in the middle of a large table and sat by the table with Y on my knee; she stretched out her hands eagerly towards the apples.

(1) I gave a shot stick with a hooked projector to S and told him to haul an apple towards him and take it, which he did. Stick then laid in front of Y. She reached towards apples with her hand first, then took up stick and held it towards me, and when I did not take it, towards S—with no result, then pulled tablecloth towards her and was getting near apple when I had the cloth held.

(2) S did as above once more. Stick again placed in front of Y.

¹ I adopt the term 'rational' from Drever's brief but acute discussion of Imitation (*Instinct in Man*, p. 232). Some writers use the term Conscious Imitation, which surely restricts the meaning of 'conscious' too much.

² *First Steps in Mental Growth*, p. 133.

Again she handed it to S. When he did not take it she put it down and pulled at cloth, then took stick and seemed to play with it, not stretching it towards the apple; then stretched it towards M, making kissing (request) noises.

(3) S reached an apple as before, and put stick down again. Y took hold of stick and offered it to me, making kissing noises at same time, then played with stick.

(4) I reached an apple with stick and put stick down. No result.

(5) S reached an apple with stick; Y offered stick to me again.

(6) I reached an apple with stick; Y again simply played with stick.

Experiment II. (1) A string about $2\frac{1}{2}$ feet long was tied to the top of the back of a chair and hung down behind the chair with an apple tied to the end of the string. Y was boxed in on the chair looking over the back with me behind her. I tested first to see if without any question she could raise apple by pulling up the string. I then called her attention to the apple. She gazed at it over back of chair, but made no attempts to get it. Apple was still watched carefully with no results. I raised it once and pretended to eat it. She now took hold of the string, swung apple to and fro and laughed; 2nd time raised it, swinging a little but not pulled right up; 3rd time raised it very high (always with one hand only), handed it towards me and then dropped it.

(2) I pulled it up again and let her touch it. She raised it again and pulled up $\frac{1}{2}$ way, then let it drop. I shortened string to about 18 inches. She seized string and swung apple round towards me.

(3) I pulled it up again hand over hand. Meanwhile she plays with chair and seems to be losing interest in apple.

(4) I again raised apple and pretended to bite it. This time she gazed over chair back, then pulled up with left hand as far as possible, then pulled with right hand and left again; seized apple with both hands and began sucking it.

(5) I dropped apple again and she immediately did as before, i.e. raised apple with left hand, and then with right hand over left hand till left could seize apple.

Experiment on Y at 1; 2. A ball and a little doll were placed out of Y's reach on a table at which Y and I sat. I drew red ball towards me with stick. Gave stick to Y and she played with it. I drew ball to me again and gave her the stick. Again she played with stick, then she drew ball towards her with left hand and knocked it off table. I put stick in right hand. She transferred it to left. I drew ball towards me with stick: Y drew it half across the table with stick in right hand, getting it within reach of her hand. I replaced ball and immediately Y put stick to it again. Drew it a little towards her and then rested. She did not seem to realize how to hook stick round the ball; only banged the ball with end of stick. After Y had played more or less wildly with stick I again pulled doll towards me, put it back and then gave her stick. She pulled ball right up to her, took it, threw it away again, pulled doll towards her and took it.

It will be seen that by now Y has the capacity to see, after several repetitions, that a certain kind of action does serve to bring

an object to her: but the artificial conditions of the experiment resulted in her being sometimes indifferent to the result (as when she threw the ball away on getting it).

Where some result is eagerly desired, as in the securing of food, the imitation of the means—e.g. scooping up with a spoon, is soon learned. This was, in fact, learned early in the 2nd year—and Gesell found that the majority of children do it by 1;6.¹ This learning would be helped, of course, by the spoon being put in the child's hand, and if the child's hand is guided at first, we have only an example of self-imitation.

By 1;0 B had also learned by imitation to kick a ball, no doubt to secure the pleasing result of seeing the ball jump away in response to his kick.

Before the end of the 2nd year, rational imitation was clearly present—thus B at 1;9 got up from breakfast-table and went to the bell and tried to ring it when he wanted his bacon.

From now onwards everyday actions which were frequently seen and were means of securing desired ends were often imitated. But of course it does not follow that the right action in a new situation will be at once detected. It may not be noticed, thus

Y, at 2;4 wanted a pincushion I had placed on top of a short pole which stood on a chair. S at my request wobbled the pole so that the pincushion fell; I replaced it at once and said, 'Now Y get it.' She only stretched her hand up again, in vain. S again got it down by shaking pole. Y again only stretched up her hand. I now said, 'Y watch S.' S again shook the pole; and on replacement this time Y shook the pole and so got the pincushion.

This reminds one of the way in which animals seem to learn to imitate some actions. Frequent demonstrations do seem to direct their attention to the means; thus my cat frequently stands up and pats the handle of the door, though she has never actually opened the door and so cannot have learned to touch the handle through successes in the course of trial and error.²

Long after rational or purposive imitation has appeared we still have primary imitation of actions for their own sakes, of which the real purpose cannot be seen. Thus

B, 2;5. Pretends to read aloud. Looks at a book and speaks mostly nonsense syllables with occasional words and phrases he knows.

Y would do the same as late as 3;0. That such imitation was not always due to wanting to be like father or mother is shown

¹ *Mental Growth, &c.*, p. 140.

² Cf. Washburn, *op. cit.*, p. 239, on the observations of Kinnaman and Hobhouse.

by notes of several of my children from 2 ; 6 to past 4 ; 0 imitating a younger child or even a baby. Thus at 2 ; 7 one would roll slowly on the floor in imitation of the baby trying to reach a toy.

Imaginative imitation for the sake of entering more fully into some suggested action, was noted in B at least as early as 1 ; 10. I was showing him a picture in which some people were running, and he ran violently up and down the room, returning to look at the picture. Again he imitated birds hopping in another picture. At 2 ; 3 B imitated 'the pig fell down' in a story M was telling him. Soon after comes the stage when the child may actually call attention to its own imitation ; thus

Y, 3 ; 1½. I was telling her a story about a tiger and a little boy and how he crawled away. She got off my knee and imitated, saying 'Like this'.

Awareness of the reason for imitating is shown in the following notes :

Y, 3 ; 8. S and I were playing and S was hitting me. Y came up and began to hit me. I asked 'Why are you hitting me ?' Y, 'Because S hit you.'

Y, 4 ; 1. I was walking with M on the lawn, up and down. Y came up and said 'Mummy, I'm coming to do what you're doing'—and joined us, stretching out her legs far to walk in step.

There would still be the purposeless imitation of fascinating actions ; thus

Y, 3 ; 8. M tells me that when I was imitating the facial expressions and hesitating hand movements of an old man I had seen playing chess, Y watched with shining eyes as if fascinated, and her face was mimicking mine.

Primary imitation among adults. From the age of about 4 years the frequency of primary, purposeless or non-deliberate imitation seems to decrease. Yet it certainly continues to appear even up to adult life, as I have already indicated, and it is possible that its frequency and influence is much greater than is commonly thought. Under the heading of 'suggestion' some psychologists have recognized its effect, though chiefly in the domain of thought and belief.

Perhaps the best illustration of primary imitation after infancy is to be found in the involuntary imitation of mannerisms. For example, I noticed that two of my boys, each of whom, at periods separated by about two years, studied under a master who had the habit of sniffing slightly, themselves acquired the habit *while in his form*, but lost it shortly after leaving the form. Burt quotes

the record of an epidemic of hiccoughs in a school in Vienna affecting more than half the pupils : and of another small school where over one-third of the pupils were suddenly affected by what appeared to be St. Vitus's dance.¹ As to adults, I have referred above to the photograph which showed the Principal of a College unconsciously imitating the action of jumping.

I invited my class of University graduates to report (anonymously) examples of involuntary imitation which they had themselves indulged in since early childhood ; 23 women and 9 men gave instances of their own, out of 38 women and 44 men. Similarly, in a second group of 43 women and 31 men, the recollection of primary imitation was reported by 35 women and 14 men. This gave a total of 58 out of 81 women and 23 out of 75 men.

The relative number for men and women are interesting in view of the fact that the observation of little children suggests that girls are more imitative than boys.²

The examples given by these students refer chiefly to mannerisms of speech or facial expression and to the imitation of movements seen when watching games ; but there are also a number of references to 'unconscious' imitation (as some of them called it) of the handwriting of some admired person. There was further evidence, too, of the familiar tendency of some persons to fall into the peculiar accent of a district to which they have removed.

To trace the possible influence of involuntary or purposeless imitation in adult life would, however, take us too far from the main object of this book. The evidence of the existence of primary imitation as a genuine innate tendency, at least in these children studied, is, I think, fairly clear : such primary imitation being due to a strong tendency to perform an action which the child finds intensely interesting, this tendency being strengthened in some cases by specific innate impulses and connexions (as in smiling and speaking), or by the gregarious or self-abasement propensities, or by the desire for fuller realization of the action.

¹ *The Subnormal Mind*, p. 297. Professor Burt tells me he has also known left-handedness in a teacher imitated by a considerable number of the class.

² This was certainly my impression of my own children, especially in reference to language. Stern asserts quite confidently that girls are more imitative than boys.

CHAPTER XI

The Innate Bases of Fears

The need for study in earliest infancy. The question of the innate bases of fear—how far experience, or suggestion, causes fears supposed to have an instinctive basis—can hardly be settled except by a careful study of early childhood. To obtain reports from adults, as Stanley Hall did, about fears that obsessed them, while of great interest psychologically in other ways, helps us little as to the problem of *innate* fears, because of the unreliability of the memory of the very earliest experiences which may have started such fears and obsessions.

We must turn, then, to the very first months of life, and follow carefully the daily development of young children, if a true interpretation of their fear responses is to be obtained. It is not sufficient merely to study a group of infants at given periods, useful as that is for certain purposes; for example, consider the interesting experiments made to find the ages at which the fear of snakes appeared. A harmless snake was shown to fifty children and ninety adults. The children under 2;0 showed no fear of the snake; by 3;6 cautious reactions were common, the children being 'tentative' in their approach. Definite avoidance occurred more often after the age of 4;0, being most evident in the adults.¹ Now this, as the authors indicate, is evidence of the importance of maturation in some sense of the term. But it does not show that the fear appeared merely through maturation, because it does not rule out the influence of greater knowledge and suggestion. Indeed, the authors themselves say, 'New things startle the child because of his keener perception of the fact that they are new and unusual. Fear arises when we know enough to recognize the potential danger.'

To make a careful study of the early stages of development in respect to fear, as well as other innate tendencies, is the more called for since Dr. J. B. Watson so boldly challenged the orthodox view of instinctive factors in the human mind by asserting, on the ground of observations of infant behaviour, that we no longer need the term instinct, and that supposed fear responses, for example, are simply conditioned reflexes, owing their existence to experience plus an original tendency to experience shock on hearing a loud noise or on feeling the withdrawal of support; with the implication,

¹ H. E. and M. C. Jones, 'A Study of Fear,' in *Childhood Education*, V, 1928, referred to by M. C. Jones in *The Handbook of Child Psychology*, 2nd ed., 1933, p. 275.

apparently, that nothing need be feared in life if we can avoid associating noise and instability (or actual pain) with it.¹

We shall discuss some of Watson's evidence for his views shortly. First, however, we may recall briefly what was said in Chapter II (last section, p. 41) about judging the signs of fear. We agreed there that it is impossible to say with certainty when the first emotion resembling one adults would call 'fear', is experienced by the infant. We can but observe the signs similar to the fundamental and usually irrepressible ones which are shown by adults under fear; and we must be on our guard against interpreting as real fear, signs of distress which occur in situations in which we might expect fear, though these may give us some preliminary guidance.

The influence of experience. Another main point of method to be observed is, of course, to eliminate the possibility that experience may be the real cause of apparently innate fear. The possibility of an unpleasant experience and even of mere suggestion establishing a fear, or at least stimulating it, must be constantly borne in mind. Dr. J. B. Watson claims that his experiments on an 11-month-old baby show that the supposed innate fear of furry animals, such as rats, is due to experience and is not innate.² I hope to show later that his conclusions are unreliable, and to give an account of experiments and other evidence which definitely suggest the existence of such innate fears, though indicating at the same time the great influence, as a stimulating and evoking cause, of experience and suggestion.

The influence of maturity. There is another possible fallacy in method, which is of great importance for us, and which may especially affect some of the 'cross section' observations made on children at a given period. It is the danger of failing to allow for the necessity of time for the maturing of any impulse, emotion, or other trait in a child—the danger of assuming that, because a supposed innate fear does not show, say, at six months, such a fear, when it does develop, must be due to experience.

The negative results gained by Watson in tests with cats and rabbits, on three infants of 4 and 5 months, have this disadvantage. The fact that the infants showed no fear of the animals at 4 or 5 months offers no proof that there was not, lurking within, the germ of an innate fear which was not to ripen until 10 or 12 months.

Watson was not unaware of this possible criticism of his tests, but replied that it has not much weight because the babies had been tested from birth to 200 days. But what right have we to assume that the maturing of such innate fears, if they exist, must

¹ See J. B. Watson, *Psychology from the Standpoint of a Behaviourist*, 2nd ed., Chap. VI.

² Op. cit., p. 231.

take place before 200 days? Many traits we know do not appear until much later; must we assume that they have no innate basis? It seems to me that Watson falls into this error in his inferences from observations of infants mostly under one month. Actual observation, he claims, makes it impossible for us any longer to entertain the concept of instinct. He rightly points out that learning has begun by the end of the first month or so; but we cannot assume that, because learning has begun, the maturing of the innate has been completed; though, undoubtedly, the fact that learning has begun imposes on us the utmost caution in inquiring how far the various supposed instinctive responses are genuinely innate.

The importance of mere maturation in the development of feeling and emotion is well illustrated by Gesell's description of the reactions of infants to confinement in a small pen enclosed on all sides but one, but illuminated. The infant of 10 weeks may be entirely complaisant; at 20 weeks there is apt to be mild dissatisfaction, and at 30 weeks his vigorous crying may suggest fear.¹

The inhibiting of innate fears by familiarity. A final point relevant to our method is the possibility that very early and constant familiarizing a child with an object or situation which would have caused fear at once, if presented for the first time at a much later period, may inhibit the fear. For example, the very fact that the infants mentioned by Watson had been tested from birth up to 200 days may very well have had this effect. Some of the evidence which I shall give later of the sudden appearance of a fear of an animal at a certain stage is made all the more significant, I think, as evidence of innate fear, by the fact that it appeared in spite of previous friendly familiarity.

The earliest signs of nervous shock or fear with special reference to sounds. Several careful observers of infancy, including J. B. Watson himself, sceptical as he is as to there being innate emotional tendencies, regard the sudden removal of support as a cause of fear in the early months. We may recall the frantic grasping of my hair by B when lightly suspended over a bath, and the facial expressions suggesting fear accompanying that, noted as early as d. 20.

Similarly a group of competent observers agree in noting loud sounds as among the earliest causes of nervous shock or fear in infancy. Darwin noted it in an infant only a few weeks old.² M. W. Shinn noted starting at a hand clap, d. 27.³ Dearborn⁴

¹ Article on 'The Individual in Infancy', in *Foundations of Experimental Psychology*, 1st ed., p. 656 (Clark Univ. Press, 1929).

² *Mind*, 1877, p. 288.

³ Op. cit., Vol. I, p. 108.

⁴ Op. cit., pp. 9 and 44. See also Major, op. cit., p. 89, and W. Stern, op. cit., p. 129.

noted nervous shock at a sharp exclamation, d. 12. It is certain that loud sounds produce specific signs which differ from the pain cry or hunger cry, namely starting, sometimes throwing up the arms, holding the breath, wide opening of the eyes. Whether a genuine emotion of fear is felt so early is, of course, quite uncertain; but the signs suggest at least what we may call, with Dearborn and others, 'nervous shock'. We cannot be sure there is anything more, because some of the signs are shown at a jolt even in sleep, as we saw in the chapter on reflexes, especially the arm-raising reflex shown during sleep. At a later stage, of course, acquired responses may be given in sleep without waking the sleeper. I myself have indeed, without waking, answered a question (not very rationally it is true), put to me when I was talking in my sleep. But at the early age we are considering, these expressive responses cannot, of course, be other than innate. We might differentiate these responses at this stage from a reflex, if we adopt McDougall's definition of an instinct (in his earlier books) as involving a specific emotion, and if we assume that these marked responses to loud sounds are accompanied by specific emotions. At this early age, however, we have no proof that they are. At this point then we can only distinguish these responses from mere reflexes by saying that they are at least the first of a series of responses, which remaining and developing within a corresponding series of external conditions, are eventually known by adults to be accompanied by the emotion of fear.

Of course these nervous shocks are not true fears if we include as a necessary part of the cause of fear the *idea* of danger, an apprehension of impending harm, which is included in the usual dictionary definition of fear and in the discussion in orthodox psychological text-books. Even in adulthood, however, 'a loud noise for which we are unprepared startles us with *momentary alarm*' . . . 'even a slight noise will give us a *disagreeable shock of alarm* if we are half-asleep'. These phrases from Stout's discussion of fear¹ seem to me to describe experiences of which the emotional aspect or feeling-tone enters as a prominent element, as it does even into wider fear-experiences in which there is time for an apprehension of immediate danger.

Even in some animals, the elementary shock due to loud noises may bring on apparently a state of continuous anxiety, so long as the noises remain. On the night of November 5th on which I wrote the preceding paragraph, a strange dog took refuge in the lobby of my home from 6 to 9.30 p.m., while the neighbourhood resounded with fireworks, remaining almost motionless even between the explosions, and making no effort to get to his home

¹ *Manual of Psychology*, 5th ed., p. 373.

only half a mile away, though he willingly trotted home after the noises were over.

Let us consider then the earliest reactions to loud noises.

B, d. 10. I noted loud crying when I imitated the crowing of a cock ; and so several times with responses decreasing in strength.

Y, d. 4. Loud chords on the piano caused a square lip and a cry about 15 seconds later.

A, d. 36. A's hands shot upwards in response to a shout.

Y, d. 42. Sudden noises causes her hands to shoot upwards.

Soon the records show the importance of the *novelty* of the sound.

d. 52. I tore up a sheet of paper ; B threw up both arms with a jerk. I repeated tear, louder if anything ; no response, three or four times, except interesting watching.

Yet mere novelty is no adequate cause of the shock. Thus on

d. 66. A watch held to B's ear was followed by the broadest smile I have seen on his face, so far.

d. 64, on a railway journey, B showed absolutely no sign of fear at rushing into tunnels or at the screech of engines, though the tunnel sounds would certainly be novel to him.

d. 68. To-night, when B was lying placidly after bath, I played chords and dischords (loud) on all parts of piano, including hand pressed down in high treble ; but there was no sign of displeasure.

The piano, however, was often played in the hearing of A and B from the earliest days ; as we have seen, it served often to *inhibit* cries.

d. 70. To-day I played slowly up scale on an accordion, including notes that had made B yell a week or so ago ; but now they had no effect, even when several notes were played together.

These notes suggest that, with familiarity, displeasure or fear at such sounds is disappearing. I played the piano, however, more frequently than I sang in the house, and on d. 75 there were loud cries from B when I was singing loudly and in a high-pitched voice in the bathroom, he being in an adjoining room.

d. 84. There was no distress shown by B at the playing of either high or low notes on the piano, though I tried especially loud playing of high notes. Nor was there any crying at the sound of the tearing of paper. But there was an obvious start at a loud laugh of mine when I was playing with him and was amused at his antics, the reaction being violent enough to suggest something more than mere surprise.

d. 85. 'Imitation of hen cackle', with loud finish, startled B two or three times (hands jerked up), but not after that ; interested, almost pleased look instead.

The change here shows how quickly any innate tendency to suffer a shock at a strange loud noise may disappear as the result of experience, and give way to mild curiosity.

Hence it is not surprising that one experimenter, who struck a metal bar whenever his child grasped an object lowered in front of her, found that conditioning did not take place, as the loud noise failed to function as a primary stimulus to fear. The child (of 1; 2) would soon accommodate itself to the sound.¹ In like manner, Y at 0; 6½, after crying bitterly when first, on my knee, put to play the piano, immediately after, on her mother's knee, began fingering the keys with interest, though at first looking up constantly at me or M. (But the change to the mother's knee may have been chiefly effective here.)

B, d. 87. When playing and talking to B, I began to sing rather loudly and he screamed for a time, then appeared very happy again. d. 98. When loud, sudden voice noises were made near him, he blinked his eyes and jerked his hands, but did not cry. Obviously this was a 'general' nervous shock.

d. 108. Piano-playing and my singing, starting gently but ending very loudly, did not cause any whimper; i.e. surprise or suddenness seems essential as well as loudness for fear or distress to be caused.

d. 108. M reports that when B was nursing, a band outside started playing. He stopped sucking, went on a moment (he was getting sleepy), then his mouth squared and he yelled, lip trembling; had to be comforted. Put down in cot (band still playing), he squared his lip again, but the windows were closed at once, and he did not cry again.

d. 109. I piped (almost like a cat mew) in a very high voice, not very loudly; there followed squaring of mouth and loud cries.

Other notes show, undoubtedly, that sudden change to loud singing or playing of piano, in the midst of quiet singing or playing, produced a cry. A sudden playing of a barrel organ outside was also an occasional cause of alarm and crying.

At least by 0; 3 in Y it was possible to distinguish a special note in the fear cry when she was suddenly lowered in my hands and let go of for a moment, the cry being deeper and more continuous than the hunger or peevish cry.

After 0; 4 B's responses to loud noises became more irregular; there was no sign of fear at loud engine whistle or loud crack of thunder (0; 4½).—At 0; 5 thunder caused a jump but no cry; my cock crow caused a look of slight fear (0; 4½) and a sudden change in my singing to a loud note caused a jump and slight cry (0; 6). After that I have no note of fear caused in B by loud noises (unless caused by some strange object, as a toy trumpet or

¹ H. B. English, *Jour. of Abnormal and Social Psych.*, 1929, Vol. 25, quoted by M. C. Jones in *Handbook of Child Psych.*, p. 275.

mechanical mouse), though I noted that A at 1; 2 cried with fright at the noise of water escaping from a bath.

Fear of the dark in the first year. It is often asserted that there is in children an innate fear of the dark. Positive signs of this will be given later, but in these early months I found no evidence of it. A note that exemplifies the behaviour of all my children at the period was: d. 86. 'Prattled quite loudly and cheerfully after light was turned out at night.' More frequently the turning out of the light was followed simply by silent composure and sleep. Thus, on d. 121, I made this note:

It is notable that B has never cried or shown any sign of fear or annoyance at light suddenly being turned out (or up).

The same thing was noted of A on d. 128 and Y on d. 112. Indeed, none of my children, until a much later stage, showed any fear of the dark when left alone in bed. Thus:

Y, 1; 0, has never as yet shown signs of fear of the dark. Indeed, she will sometimes lie quiet when light is put out even when she has just been crying to be taken up.

Precisely the same was reported of the children E. W., A. H., B. H., Y. H., J. B., and H. B.¹

At a later period, however, as will be seen, this fear of the dark did appear in several of my children (and in children of my collaborators), especially when they were sent alone into a dark room, though B seemed usually impervious to such causes of fear.

A note on B just before 0; 4 shows *greater sensibility to alarm when just falling asleep*, which most of us probably still show in adult life. M noticed that B was much startled when a paper touched his head (and rattled) when he was dropping asleep at the breast.

The influence of general conditions on fear. We must guard against the assumption that a given stimulus produces nervous shock or fear in an inevitable and invariable manner. If (as we saw in the chapter on Reflexes), it is true of some reflexes that their recurrence is dependent upon conditions other than the mere stimulus, it is still more true of fear. The presence of a companion is a well-known banisher of fear. Thus a little child who is afraid to go upstairs in the dark alone may have little or no fear when accompanied by his father. The father himself may feel a tinge of fear in walking through lonely woods at night, and yet find that fear banished by the presence merely of a child companion.

¹ These are children of former advanced students of mine who kindly made records for me: Mr. H. P. Williamson, Mrs. A. L. Harrison, Mrs. M. E. Brash.

This last example illustrates the fact that such exorcising of fear is not due to a rational inference that the companion will protect one. It is a much more primitive feeling of comfort through companionship and appears in a very simple form (almost like a simple sensory inhibition) in early infancy. Y, for example, when just a month old, showed not the slightest trace of reaction, not even a blink of the eyelids, when the door was banged loudly *while she was contentedly nursing*. Again, with B :

o ; 3. Imitation of roar of a tiger caused squaring of lip ; continued to stare anxiously at my face but no cry. I then hid my face behind a towel and repeated the roar ; result, violent streams, soon over when I reappeared and comforted him. (Apparently a case of fear of specific or novel noise, as it was not especially loud, no louder than a loud laugh of mine which had just caused no cry.)

Evidently the noise had not its complete effect when my face was visible. The barrel organ also, which had disastrous effects on d. 118, had little effect on B when his mother was nursing him. Thus,

d. 139. The barrel organ began while B was nursing. Looked up at M with puckered forehead. M smiled and spoke to him, and he smiled and showed no fear, as he had done on a previous occasion.

It seems highly probable that this modifying influence of companionship is the cause of many apparent individual differences in the records of response to supposed fear stimuli. The reactions to a strange animal, to fur, to strange noises, &c., are sometimes studied when the child is in his mother's arms, or at least in the presence of a familiar friend, and sometimes when they are alone or, at least, are unaware of the presence of another. On this the following note is suggestive :

B, o ; 6. A cow passed near him to-day. He watched it with great interest and then, some 15 seconds after it had passed, cried with a square lip, a very short cry, and was then happy again. He was *alone* in his cot.

The most notable thing about this period of 6 to 12 months, so far as B was concerned, is the absence of signs of fear. During these six months I have only four observations on fear reactions in B, in some 75 quarto pages of notes, and only eight such notes in the next twelve months, in 130 pages. 'That fear is one of the characteristic feelings of the child needs no proving,' wrote Sully. This was certainly not true, during this period, of any of my children. That is, their environment, as they perceived it, rarely produced signs of fear. Sully's statement is, of course, true, in the sense that it is characteristic of little children to fear some things which we have ceased to fear. But the generalization

that they are 'actually timid' is too sweeping, if intended to apply to the first year or two, and to all children.

Fear of pain. Sometimes, indeed, the absence of fear is surprising, especially, for example, when physical pain was the thing to be feared. Thus,

1; 7. B is still full of adventure, constantly climbing chairs and railings. He climbs on his little go-cart, though it frequently falls over on him. Often immediately repeats something which has led to his being hurt.

1; 8. B fell down half a flight of stairs on his back: kept his head from bumping till the bottom. Screamed loud for about half a minute. I took him from maid's arms but he at once wanted to be put down and started climbing stairs again! No fear here.

Several of my other children showed a similar disdain of pain. At an earlier period C, at 1; 3, climbed on a chair; it fell over, C banged on the floor and screamed. Within 2 minutes C climbed again; a worse fall and more screams. In 2 or 3 minutes C climbed up again!

Again Y at 3; 1:

On getting into a big bath from a chair, she fell sideways, catching her foot in the chair and dragging it over. It hit her sharply in the ribs; violent screams and catching of breath. But before sobs had ceased she placed the chair in position again and climbed over, saying, 'Don't help me', when M offered to help.

Others showed similar fearlessness of pain, though none, perhaps, as frequently as B, who may have been exceptional in this respect. The general impression of my wife and myself was that none of our other children equalled him in *general* fearlessness, though as regards the absence of specific fears, others did equal him.

In view of the attempts to obtain some estimate of the later development of character and temperament, as well as of intelligence, from observations on the first year or two of life, it may be worth noting that, as a grown boy, B was remarkable for absence of fear in many ways, in the sea, in his first experience of horseback-riding, in climbing cliffs, in rough games, &c., a fearlessness that often caused anxiety to his parents. (We shall refer to this again later.)

Fear of high places. In view of the shocks felt in early months, when support is suddenly withdrawn, it is remarkable that we had frequent evidence of the lack of fear of falling from the edge of beds, down flights of stairs, and from ladders when the infants were themselves climbing, and not merely being held. B is noted at 1; 8 as liking to jump off a high sofa, in marked contrast to Major's son, who at 1; 7 was afraid to step off elevations such as the street-curbings.¹

¹ Op. cit., p. III.

Two notes above have already indicated absence of this kind of fear in B and Y. But it was notable in others and even the somewhat timid C greatly enjoyed climbing nearly to the top of a tall garden ladder of about ten rungs, at the age of about 1; 4. I should add that, with due precautions against accidents, we allowed such climbing, and all our children from the age of 5 up to adolescence astonished us with the confidence with which they climbed tall trees or walked on high walls.

Another thing sometimes referred to as causing fear in infants, namely fur, was never observed to cause it in any of my children. B called his mother's furs 'pussies'—which he loved.

The appearance of other fears, with special reference to animals. So far we have given no definite evidence of innate fears other than those aroused by loud noises or loss of support. From the time of about six months, however, new suggestions of innate fears began to appear among other records which continue to show negative results. I give first the other notes on B for the period 6 to 12 months.

0; 8½. No fear of hideous mask I put on; smiled, and so when the mask was on M; but he did not grasp at it until M touched him with it, when he did.

0; 11. Yesterday he had a new toy given him, an elephant. He seemed frightened of its trunk; he touched it once or twice, drawing back his hand quickly.

1; 0. Mrs. D. brought in a noisy clockwork donkey. B looked with interest and then suddenly turned away and hurried to me. This twice. Then he approached one hand to it, but drew it back (fear apparently) without touching it. (I have seen identical behaviour in a kitten when approaching a mechanical mouse.) This two or three times. At last he dared to touch it and then courage grew and shortly he took it even when it was growling.

The conflict and alternation here of fear and curiosity are obvious.

1; 5. Showed no fear of dog even when it licked his feet: but cried later when near cows in their shed, though not when near horse (not so near though). May have heard cows low. Also he is familiar with horses. 1; 5. Afraid of calves, when taken near them, unless held by M. Was afraid to go to Mr. M., the big smith, yesterday at first; cried when he took him. Later made great friends though.

1; 8. Our neighbour's dog tripped on string of B's horse and yelped. B cried, and showed fear of dog on its re-approach. The first apparent fear of a dog, I fancy. 1; 8½. He cried a little (apparently afraid) at a bull-terrier, though the latter did not bark. But he was frightened by the roughness (playful) of a dog some days ago.

2; 1. B afraid of a bulldog in our nursery to-day. Clung to his mother, would not come to me (I was a little nearer the dog). But nurse

says a bulldog 'went for him' some time ago, though as we never heard of this, I expect it was, at the worst, rough playfulness.

I wish here to suggest that the quickly established fear of the dog (especially at 1; 8) suggests *an innate tendency ready to appear when occasion arises*; and we may turn now to consider the question of the *innate fear of animals*. B certainly seemed to show such a fear of cows. But it is possible that the lowing of the cows was the basis for this, the sound causing fear at an early period and so becoming associated with the sight of a cow. This would be in accordance with Watson's ingenious experiment mentioned earlier.

Watson's experiments, however, do not, I think, dispose of the view that there is an innate tendency to fear strange animals. They show that, by association with a terrifying noise, an animal not feared at the time may rapidly come to be feared. But they do not prove that all such fears in later childhood are based entirely on experiences and are really conditioned reflexes. For Watson ignores the important question of the date of the maturing of an instinct. It is no proof of the non-existence of an innate impulse to fear to show that it does not exist at the age of 11 months in one or two children, but that a fear can be artificially created at that date by association with fearsome sounds. This last is quite consistent with there being *also* an innate fear tendency which would have revealed itself apart from such association at, say, 18 or 24 months.

I never noticed the slightest fear of a dog in B (or any other child, I believe) before the age of 15 months. Thus a note at 0; 6 says 'No fear of Tweed [a big sheepdog, at a farm]. Intensely interested in his moving tail. Grabbed it later.'

When the signs of fear appeared (at 1; 8) the experience hardly seemed to afford an adequate explanation of the appearance of fear. B cried when the dog yelped, after tripping on the string of his horse, and later B showed fear of the dog, though no dog had been feared before. But he must have heard dogs yelp dozens of times in the course of his many outings from the first month to that time.

My own strong impression at the time of such observations was that the experience of the dog tripping over near him and yelping would have been ineffective in producing subsequent fear, had there not been, lurking in the background as it were, a tendency towards such a fear, waiting only to be called forth strongly by some slight shock or disturbing incident.¹ With the observations

¹ William James reported that his little girl had been familiar with their pet dog from her birth, and then at about 0; 8 suddenly began to show fear. *Principles of Psychology*, II, p. 417.

about the fear of dogs and cows should be compared such notes as that above also at 1; 8, which showed such absence of fear when B fell down a flight of stairs that he immediately wanted to climb the stairs again; and again at

1; 9. Fell on his face when jumping from a chair and cried hard, but almost at once climbed and jumped again. So when he hurt himself again. Apparently willing to take risks for the excitement of jumping.

B's readiness to show fear of a dog at slight provocation has thus to be contrasted with this absence of fear even when real pain was suffered under circumstances in which no object stimulating an innate tendency to fear is present.

Also warnings against hurting himself by climbing were of little effect: whereas at 2; 2 M got B to keep away from sheep merely by telling him they would bite, though he had never been bitten.

Some observations on my other children are still more suggestive of an innate fear of strange animals or animal toys, especially when moving. At 1; 2, X showed great fear of a Teddy bear *when it was moved toward her*; she turned away, trembling in every limb: but when it was still she would pick it up and kiss it.

Also when a new tiny clockwork Teddy bear was given to Y at 2; 3 $\frac{3}{4}$ and it moved towards her, Y withdrew rapidly, and so on a later occasion, saying 'No'. When it was at rest she seized it. Again, on its moving, she shivered and said 'No more—cos it's nice' (apparently an attempt at auto-suggestion which Y several times practised at this period). Now this in no way resembled any animal she had seen; and the general situation suggested toys and fun. Again,

A, at 1; 9, showed great fear of a velvet rabbit which was among his Christmas presents. He screamed and ran away from it; yet I am confident that he had never had any unpleasant experience with a rabbit or anything resembling it.

Other observers may be called to witness. Darwin found that his child of 2; 3, when taken for the first time to the Zoo, 'was much alarmed at the various larger animals in cages'.¹ Darwin adds that he could not account for this, and the preceding paragraph shows that he was fully alive to the possibility of strange noises causing fear. Major also found that his child of 2; 11 was just as frightened of the quiet animals, camels, deer, &c., as of the more terrible lions and tigers.²

¹ See his 'Biographical Sketch of an Infant' in *Mind*, Vol. II, 1877, p. 288.

² Op. cit., p. 105.

Y, 3; 6. Taken to menagerie for first time. She knew that lions sometimes bite, but we had told her that they were safe in the cages. There was no fear shown whatever before entering the menagerie, rather pleasurable excitement; but as soon as she saw the animals there was obvious fear, and she asked at once to go back to the car. She had heard only pleasant stories of elephants, but would not go near one even in my arms, still less would she give it biscuits, though she saw M doing so. Later she said, 'I love elephants' (I had told her they do useful work for men) 'but I don't want to go near'. She shrank even from the quiet placid camels. Later overcame some of her fear but showed no willingness to go near the cages.

Perhaps the most interesting observations, however, on the fear of animals or of the uncanny are those made for me by my former student, Mr. Williamson, on his little girl E. W. They are as follows:

0; 5. E. W. showed apparent signs of fear when a large inflated swan was brought near her. She cried, drew away, looked towards M, &c. She had seen the swan once before when slight signs of fear were shown, but the swan was not moved towards her. 0; 5. No signs of fear, but interest and delight when shown a large Teddy Bear for the first time, even when brought near her.

1; 0. Frightened if taken near a horse or cow, although most interested at watching them from a distance. (N.B.—This fear gradually became less during the succeeding months.)

1; 3½. Whimpered and came running to her mother when she accidentally touched a worm while playing outside. 1; 4½. I tried to accustom her to worms by showing them to her and saying 'Nice worm'. She repeated 'Worm' but whimpered and apparently alternated between fear and curiosity—sometimes put her hand out to touch the worm but always withdrew it before actually doing so. On several occasions during this week she has found a worm while playing and came whimpering to M saying 'Worm, worm!' and not satisfied until her mother came and threw it away.

1; 6½. We had caught a mouse in a trap of the 'nipper' variety. I held up the dead mouse and showed it to E. At first she edged away, but when I said 'Eileen hold it', she clutched it and 'loved' it, saying 'Nice mouse'. She carried it about for a few minutes, stroking its fur and saying 'Pretty'. When I pointed to its mouth and eyes she again showed slight signs of fear, but forgot these at once when I suggested she should give the mouse to the neighbour's cat. Up to date E has not shown fear of dogs, even when they barked quite near her, and only a temporary fear when a dog jumped up at her (playfully).

Sometime ago showed disinclination to stroke a cat, and recently, when she was quite on friendly terms with cats, was frightened at two kittens about a week old—would not touch them and shrank away, clinging to M. This furnishes an example of fear of *strange* animals—she had never seen a tiny kitten before.

Such fear of horses, kittens and worms at least can hardly be explained by reference to their noise, or by their doing E. W. an injury. Similarly Major's child showed great fear of a kitten at 1; 10 and of a worm at 1; 7.¹ Still more striking are observations by G. V. Dearborn, which show a fear of a horse maturing *in spite of* harmless experience with it. He writes of his daughter at 1; 1:

Several sorts of fear, for example, that of falling or that of large animals, seem to be now developing rapidly, for she was greatly frightened to-day when set on a horse. The last time this was done she showed only a little fear, and the time before that almost no signs of any.²

Experiments on 'conditioned' fear responses. I thought it would be of interest to see what would happen if Watson's experiments were repeated with a child about the same age as his subjects, not with animals but with some neutral and unfamiliar object, such as a strangely coloured design or curiously-shaped box. I will now describe these tests, together with several others which bear on the relation of fear to suggestibility.

First I may recall for the reader the main plan of Watson's experiments. An infant of 11 months (Albert), who had never been out of the hospital, was first tested and found to show no fear of animals, but to throw up his arms and cry at the sound of the striking of a steel bar. A white rat was now put before Albert, and, whenever he touched the rat, the steel bar was struck behind him, causing him to start violently. After about half a dozen of such experiments—at intervals—Albert cried at the sight of the rat and hurriedly crawled from it. It was later discovered that fear had been 'transferred' also to a rabbit, a fur coat, and, to a less extent, to a dog.³

Now I have suggested above that this fear of the rat was readily established, partly because there was an existing innate tendency, though as yet unawakened, to fear the rat. In my own tests I therefore first selected some object which, though unfamiliar, could not be supposed to have any innate fear attached to it, namely, an old pair of opera glasses. One hesitates to perform experiments causing even momentary discomfort to one's little ones, but Y was an exceptionally healthy, strong, and jovial youngster, and I hardened my heart sufficiently to try one or two simple tests with her.

Test 1. Y (aged 1; 0½) was on her mother's knee. The opera glasses were placed on a table in front of her, after she had handled them a moment or two. When she stretched out to seize them and as she

¹ *First Steps in Mental Growth*, pp. 100 and 103.

² *Motor-Sensory Development*, p. 135.

³ J. B. Watson, *Psychology from the Standpoint of a Behaviourist*, pp. 231 ff. (Philadelphia, 1924).

touched them, I blew a loud wooden whistle behind her, as loudly as I could. She quietly turned round as if to see where the noise came from. The process was repeated, with the same result.

She was now put on my knee. I carefully kept the whistle from her sight and blew it again when she touched the glasses, and she again turned round, showing no sign of fear. The tests showed that, *in itself*, the whistle was inadequate to startle the baby, though I blew on it as loudly as I could. This fact provides us with results of considerable interest in the next test.

Test 2. The same afternoon, Y, seated on my knee, was shown a 'woolly' caterpillar on her brother S's hand. She had seen one before but had never touched it or been plagued with one or had fear or disgust of one suggested to her, to the best of my knowledge.¹ She repeatedly turned away with a shrug of the shoulders or slight shudder, 'wagging' her hand from the wrist at it (as she does sometimes when annoyed), but without touching it.

When she turned again to look at the caterpillar, I loudly blew the wooden whistle. At once Y gave a loud scream and turned away from the caterpillar. This was repeated four times with precisely the same effect.

It is remarkable that the blowing of the whistle, which that same morning had caused only a slight interest, should now so accentuate the reaction to the caterpillar. It can only be explained, I think, on the assumption that the attitude towards the caterpillar was a very *unstable* one, ready to be changed to great excitement and fear, or to calm acceptance, as seen later. The loud whistle, in itself undisturbing, provided just the slight added shock to make the fear of the caterpillar burst forth.

Test 3. Later in the same day, S brought out his woolly caterpillar again, on a leaf. Y was now seated on her mother's knee. Again there was in Y the curious alternating of apparent fear and curiosity. She would look at the caterpillar, then suddenly turn away—back again—away again. Then she called it by 'snapping' her fingers towards it (as she did towards things she wanted). Then she jerked her hand away again. Then she called to another brother, by snapping her fingers towards him. (She is very devoted to this brother, who plays with her a great deal.) He took the leaf in his hand, said, 'Pretty thing', and at once Y put her hand right to it, apparently to seize it; it had to be snatched away.

Test 4.—The next day, Y, seated on my knee, was again shown the caterpillar, on her brother's hand. She 'asked' for it by snapping her fingers towards it. I blew the whistle again behind her. She shivered,

¹ S had only just discovered his caterpillar and assured me that he had not attempted to tease Y with it. I have complete confidence in his truthfulness; and even if Y had been teased, such teasing implies a pre-existent dislike. And even if, to go further, fear of the caterpillar had been suggested to Y, this would not affect the most interesting result of the test, as will be seen.

leaned over towards her brother, and put her arms round him. The whistle was repeated four times with exactly the same result, each time a shudder and a turning to her brother with outstretched arms put around him.

The brother was now sent out of the room, the caterpillar put on a box and held near Y. Again the whistle was blown, and this time she looked at the door by which her brother had gone out and whimpered.

Here we have again the rousing of the lurking fear by the added disturbance of the whistle. [We may have the curious phenomenon of the whistle having acquired some added disturbing quality through association with the caterpillar before. This second alternative is not necessary in view of the history just recorded; but *both* may be true.]

Test 5.—Two days later Y again saw the caterpillar on her brother's hand. She looked with interest at it; but showed no fear, no withdrawal or whimpers. Then I made expressions of disgust, and observed: 'Very slight agitation shown by Y. She looked anxious, slight momentary whimper. I got M to make expressions of horror or disgust. Y at this reacted to caterpillar much more markedly—turning away—whimpering decidedly, &c.'

Just after this, I heard her make a good imitation of my 'disgust' grunt.

With the results of these tests may be compared some other observations on Y and B.

Y at 0; 11½. It was reported to me that Y has frequently been near a horse in the field opposite our holiday house, but that when A put out his hand to pat the horse, after giving him a lump of sugar, and the horse snapped, Y immediately shivered and turned her back on him. To test this, Y was taken to the field in M's arms. She stretched out her arms to the horse and showed no fear, but was not allowed to touch the horse. Then she was put into her brother's arms; she several times turned away suddenly with her back to the horse, but there was no cry. Then I took her and let her get her hand near the horse's nose, but not near enough to touch it. He put out his mouth and opened his lips as though to take another apple which we had just offered him. Y turned with a cry and a jerk, turning eagerly towards her mother, and cried a little even when in her mother's arms; she looked perturbed. After being comforted, she again put her hand toward the horse.

Now Y has certainly had no unpleasant experience with horses or been so near one before. The whole series of reactions suggests an alternation of feelings, or impulses of curiosity, with a lurking fear in the background. And the observations support the tests with the whistle and the caterpillar in suggesting an innate but unstable fear tendency.

The theory that all fears are 'conditioned' reactions due to

association with disturbing sounds is also impossible to reconcile with some of the evidences of *fear of the uncanny*, of the familiar and unfamiliar combined (to be dealt with more fully later). I have already mentioned B's fear of the mechanical donkey, a toy which was nevertheless a moving thing.

At 1;0 months Y showed apparent fear of her brother dressed in his black cat fancy costume. She looked anxious, gave a sharp cry, and then turned away.

At 1;2½, Y showed great fear of her brother when he put a brown paper bag over his head, when she was playing happily with him in her playground. She cried suddenly with a high scream, hurried to the far corner of the playground, 'waggled' her hand at him and turned from him to me. He took off the bag and she became quiet. When he put it on again, there were similar signs of distress, perhaps not so great, but accentuated when he bobbed his head at her; and so for a third time, fear being apparently so great that I made her brother put the bag away.

Even assuming that the fear of animals is always due to some chance association with loud noises or withdrawal of support or to suggestion, we can scarcely imagine that such weird combinations—that of a boy with a paper bag on his head or a boy dressed as a black cat—can become fearsome by association. These, and other examples in the records of careful observers, of fear of uncanny strange things, make it certain, as it seems to me, that we must assume an innate tendency to fear under certain conditions. Not that there is a specific definite fixed innate fear of, say, all furry animals; what the facts suggest to my mind is that there is, first, a general tendency to fear the very strange, especially when closely associated with the familiar. But this general tendency does not seem to carry us far enough. For in the case of animals, it seems as though the fear can suddenly develop when the creature has already become familiar to the child. It would seem we must assume a further tendency, again varying greatly with the individual and with the condition of the individual, to fear especially live, moving things; a faint tendency, so that it can easily be modified by repeated experience or even suggested away; yet sensitive, so that it can easily be stimulated by suggestion or by a supplementary stimulus causing a general disturbance.

Some of Watson's own observations seem explicable far better on these assumptions than on his own theory. Thus in his attempts to 'recondition' infants who already feared some animals, he notes the following:

Vincent showed no fear of the rabbit, even when it was pushed against his hands or face. His only response was to laugh and reach for the rabbit's fur. On the same day he was taken into the pen with Rosey, who

cried at the sight of the rabbit. Vincent immediately developed a fear response ; in the ordinary playroom situation he would pay no attention to her crying, but in connexion with the rabbit, her distress had a marked suggestion value. The fear transferred in this way persisted for over two weeks.¹

Note that, ordinarily, Vincent took no notice of Rosey's crying. But the rabbit, previously unfearred, combined with the suggestion due to Vincent's crying, at once set up a fear. How is this explicable except on the assumption that there was latent in Vincent an innate tendency to fear things like the rabbit ? To say that it was entirely due to suggestion is to leave unexplained the complete absence of response to Rosey's crying previously. The example, indeed, forms a remarkable parallel to several of my own tests given above.

I do not wish to underestimate the power of suggestion. I have already given examples of it. Another may be quoted here.

B, at 2;2, showed no fear of a tortoise, seen for the first time ; he handled it. But when he was approaching it again, I said, 'He'll bite,' and B sprang back quickly.

In view of this undoubtedly great influence of suggestion upon an infant's attitude towards things, I carried out a further brief test on Y.

Selecting an object Y had never handled, a bottle of yellow pills, I put it on the table near her, and made expressions of disgust and horror. She looked at it interestedly, put out her hand, and drew back. The process was repeated, a brother of Y joining in the game and expressing his dislike in a similar way. Then I put the bottle much nearer and, after a moment's hesitation, Y put out her hand and grasped the bottle and ignored all further suggestion. Here, with a 'neutral' object, suggestion almost completely failed.

It is probable that there is such a thing as innate interpretation of genuine expressions of disgust or fear and that our expressions were not sufficiently good imitations. The contrast, however, of the stronger effect on Y of slightly expressed fear on my part equally unreal when some living creature was the object, was very marked, as will be seen by comparison with some later and some earlier notes, including the one just given on B and the tortoise.

My contention is, then, that while suggestion may undoubtedly be very effective in stimulating fears, the power of suggestion seems to be so much greater in certain ways, as in stimulating the fear of animals or of the dark, than it is in other of the many occasions that a parent uses it (as in suggesting that foods are nice, or that children will fall if they climb), that we can more reasonably believe

¹ See 'What the Nursery has to say about Instincts', *Pedagogical Seminary*, 1925, Vol. 32.

that in the former cases suggestion is appealing to a latent impulse in the same direction, whereas in the latter cases there is no such innate tendency.

Further experiments more recently carried out on fifteen healthy, active infants to see if they could be conditioned into fearing or disliking objects of no biological significance—as in the case of my opera glasses—afford additional evidence in favour of the view put forth.¹ The objects (a wooden triangle, a ring, &c.) were presented in conjunction with a loud electric bell, and those children who were startled by it were selected for training. Similarly pleasant stimuli were associated with objects. The results were marked by an absence of conditioning, even after six experimental days. The ages of the infants were from 0; 8 to 1; 4.

Fear of the uncanny. Whether we regard the fear of certain animals as a specific fear or as an example of the more general fear of the uncanny, there seems to be no doubt as to the fear of the uncanny, in the sense of strangeness associated with the very familiar. James's famous example of the dog which had a fit at the sight of a bone being drawn along by an invisible thread, and the behaviour of Köhler's chimpanzee which 'went into paroxysms of terror' when Köhler tried to give him some stuffed toys which faintly resembled animals and had black buttons for eyes²—these phenomena remind us that even among animals, fear of the utterly strange, or of the strange blended with the familiar, may reveal itself; and this affords further *a priori* evidence, at least, that we may expect some similar innate fear in human beings.

In children the fear of the uncanny continues to show itself at later ages than the other fears which we have chiefly considered so far, but I begin with the earlier records.

Y at 1; 5. M in room. I crawled towards her (Y) on hands and feet, monkeywise, with head down. She retreated to end of room, looking frightened and cried out, 'Mamma', in an alarmed tone, half a whimper. Even when I looked up and smiled there was still an expression of distress, and wagging of hands at me afterwards. Then she ran to M and when seated on her knee, Y showed no such signs when I approached right to her.

Repeated above test. Again Y retreated from one side of the room to the other till she could get no further, when she bent and kissed the top of my head, which was directed towards her. Later, again, a similar retreat and a similar kiss.

1; 7½. Y showed great dislike of a doll, the top of whose head, with the hair attached, opens backwards. She cried, moved away, and wriggled her body repeatedly. When the head closed and said 'Baby', Y said,

¹ See Elsie O. Bregman, 'An attempt to Modify the Emotional Attitudes of Infants by the Conditioned Response Technique', *Jour. of Genetic Psych.*, Vol. 45, 1934, p. 169.

² *Mentality of Apes*, p. 320.

'Baby', and took the doll in her arms, but again horror was suggested when I opened the head. Yet she can scarcely have any idea of the injury caused by opening a head.

2;5. Y broke a favourite doll. She showed evident disinclination to touch it; and though later she accepted the half-decapitated body, when I held towards her the doll's eyes which remained joined by a wire, she retreated with whisperings of 'No, no, Daddy.'

Dearborn noted a similar fear in his girl at 1;1. She would not touch the arm torn off a favourite doll, nor a porcelain doll that had lost its head.¹

Stern² records the fear at 3;3 of a parent dressed up as an elephant, though no fear of a real elephant had been shown. As late as 6 years of age my boy C whined and cried out, 'Don't, Daddy,' when I pulled a fierce face in the full light, especially when I covered my face with a clawing hand. I asked, 'Were you frightened?' 'Yes.' 'But you knew it was Daddy?' 'Yes.'

It will be noted that these fears of the uncanny nearly all occur after the age of one year (the date at which Watson tested his infant), so that time for maturing was given. It will be recalled that B showed no fear of a mask at 0;8. I know the reply to this might well be that time was also given for suggestion and experience, but I have given cases in which that seems to have been ruled out.

Again, a child who was exceptionally free from fears, even of loud noises and withdrawal of support, and at 1;10 showed only curiosity when an alarm clock 'went off' in his hands, cried and turned away when his father put on a *mask*, laughing when it was removed.³

H. Hetzer and L. Koller also found that a hare mask caused a child of 1;0 to wince and strike out, one of 1;5 to scream, and one of 1;9 to cry, but to laugh at the mask when it was taken off by the experimenter.⁴

Fear of the sea. The fear of the sea seems equally inexplicable either by experience or suggestion. In this matter I could be certain that there had been no unpleasant experience or suggestion, as I was with at least four of my children on the occasion of their first sight of the sea, and every encouragement was given to them to like the sea and go into it. The first note is of

A at 1;4. Showed fear when held in my arms near sea: would not put his feet in it at all. Screamed when his feet were put in. No forcing, of course, was attempted.

¹ *Moto-Sensory Development*, p. 137.

² *Op. cit.*, p. 498.

³ These observations were made for me by my colleague, Mr. A. E. Chapman.

⁴ See Vier Testreihen für das zweite Lebensjahre, *Zeitschrift für Psych.*, Bd., 117, 1930, p. 272.

B, 2; 2. Showed some slight fear when taken for first time to edge of the sea. At least he said 'No, no', when I urged him to go into (or even nearer than two feet to) a quite shallow, calm, narrow passage between rocks. 2; 6. Would not go even to the edge of the sea with M, who was paddling.

These and later observations conflict with the suggestion sometimes made that it is only the noise of the sea that alarms children.

The following year (at 3½ years), however, B's fear greatly lessened and he went readily into the sea up to his waist. This fear of the sea *before it was entered*, shown by A, B, and X, is evidence against Watson's theory that fear of the sea is 'the same type of response that we get from loss of support'.

X had her first experience of the sea at

2; 5. She was very frightened at first. Would not even paddle for several days; but by end of a week she loved it though she would not lie on her back even in very shallow water.

This overcoming of the fear of the sea was quicker in X than in the case of any of the others, and at 3 and 4 years and later she was so courageous that we had to keep a strict watch on her.

In each of the three cases, then, A, B, and X, there was shown an initial fear which could not possibly be explained by experience. Their only experience of being in water (in their baths) was always a delight to them; nor did they know anything of the sea's depth beyond the shallows. There must be something in the great expanse of water which strikes awe into the child.

I have no records of C in reference to the sea, though both his mother and I well remember his nervousness by the sea's edge. My first record of Y is at 11 months and is about an earlier age than that at which any of the others were taken to the sea's edge.

Y, 0; 11. Taken down to rough sea, held near by me, her mother keeping away purposely. Gazed fascinated; made gurgling half-laughing sounds. No signs of fear.

Evidently fear of the sea, if it is to come at all, is not yet matured. At 1; 11 Y was taken (in my absence) to the wide sands at Southport, where she may have had some experience in paddling in shallow pools and seen the sea at a distance, and possibly near to, but was not taken into it. Her experience would be such, if it influenced her at all, as to make her a little familiar with the sea. At 2; 11, Y was again taken to the seaside. She went into the sea in her mother's arms without showing any sign of fear. The sea was calm. When dipped she gasped a little, apparently at the cold. The next day, however, when the sea was 'choppy', she showed evident signs of fear and would not go in, even when

carried. Next day it was calmer again and she was willing to go in a little, and the day after she allowed me to swim with her on my back. Soon after, she would go off alone to paddle in deep pools; but all that holiday she remained apprehensive of bathing in the sea when it was at all rough, though she had had no unpleasant experience in rough sea, and all suggestion was applied in the direction of encouraging her. Further, she had the example of brothers and of several other young children around who were absolutely without fear of the sea and greatly enjoyed bathing.

Summing up, we find, of the four children carefully observed, three, including two exceptionally fearless children, showed such fear of, or at least timidity, about the sea before it was entered as could not be explained by experience. Y did not show such fear before entering the sea, but it may have been overcome by familiarity during the visit at the age of 1;11, or, in her case, the tendency may have been only aroused on actual entry into the sea. Suggestion certainly cannot explain the timidity of these children as we were constantly trying to encourage them to paddle and play in the pools and at the sea edge.

Fear of the dark. In the case of this fear which is constantly recognized as a childish fear, it is as impossible to understand experience as a cause, as it was in the case of fear of the sea. I am more disposed to recognize, however, in this case, the influence of suggestion as a factor in greatly stimulating the fear.

As already mentioned, none of my five children evinced any fear of the dark during the first year and longer; and the same was reported of the children E. W., A. H., B. H., and Y. H., J. B., and H. B. Mrs. E. H. Hughes also reported that one of her boys showed no real fear of the dark until the 4th year, and a second boy not until the 5th year—and both just after an illness.¹ Even when children are restless and cry when the light is put out, it may be boredom or desire for company.

Other records of early fear of the dark also seem to afford no example of such fear in the earliest months.

Thus in an inquiry in which eight parents reported on fears shown by their children in a period of 21 days (at some time before the age of 1;0) none reported fear of the dark.² Among my own children no signs of fear of the dark appeared before the age of 2;0. All these facts make it difficult to accept Karl Bühler's view that the dark is feared because of the impression of strange-

¹ Reported in an unpublished thesis accepted for degree of Ph.D. at London University, 1934.

² See A. T. Jersild and F. B. Holmes, *Children's Fears*, pp. 50-1 (Columbia Univ. Publications, 1935). It should be added that these parents were not specially trained in psychology.

ness.¹ For it is only long after the child has become thoroughly used to recurring darkness that the fear arises. It may be true, however, that such fear is first experienced when the child is in darkness under relatively novel circumstances. The earliest note of any such fear is that on

Y at 2; 1. M went down the greenhouse steps into a dark cellar saying, 'Come into the cellar.' Y was unwilling, saying 'No, no.' As she came away she said 'Dark, kikky' (nasty). When Y was 2; 2 a brother said in an eager tone, 'Come up the back stairs in the dark,' and Y replied 'Oh, nice dark.'

This was possibly an attempt at auto-suggestion. It was also reported to me that at 2; 5, when shut out in a rather dark passage by a brother, she said, 'Some one's catching me'; and then, as if to reassure herself, she said several times, 'No one's catching me.' By that time she had shown no fear of being left alone in the deeper dark of her bedroom. Only at 3; 1½ did she show dislike of being left in the dark in bed. It was the first night of the change from summer (daylight-saving) time, and so it was darker than it had been for the last few months, and she said, 'I don't like the dark light.' But the next and following nights no such aversion was shown.

It is because of the possibility as to suggestions being made by nurses and others that I regard the fear of the dark as more likely to be subject to suggestion, though it may reasonably be argued again that, to a child who has never known any ill effects of 'being caught' or of ghosts, such strong effects of suggestion imply a predisposition to fear, and especially to fear of the dark.²

Suggestion does not seem a likely cause of the fears of E. W. reported by her father as follows:

E. W. at 1; 4 showed signs of fear on noticing the *contrast* between the lighted room and the dark view from the window. Showed this fear of dark when I took her to the window to look out. No fear of view from window. No fear of being left in the dark or of the light being switched off or on when she is in her cot. E. W., 1; 5, End of 'Summer Time'. E. W. was in lighted room—looked out of the window, pointed and kept saying 'Bark' (dark), whimpering, wrinkling brow and coming close to her mother. She was quite easy again when curtains were drawn. I invited her to 'Come and look at the dark', and she hesitatingly came

¹ Bühler, K., *Die geistige Entwicklung des Kindes*, 4th ed., p. 115 (Jena: Fischer, 1928).

² Professor Burt remarks, 'Let us imagine two experimenting mothers, one trying to condition her child so that it should be frightened by the dark and the other trying to condition hers so that it should be frightened by the sun. There seems to me no doubt that the former would succeed as easily as the latter would fail.'

with me towards the window but drew, shrinking back, when I opened the curtains a small distance. Again, no fear was shown when put to sleep and the light switched off.

E. W., 1; 7. I observed that she was no longer (apparently) afraid to open the curtains and look out from the lighted room into the dark. I think that a trace of the previous fear remains but only enough to be pleasantly stimulating. She is still very hesitant about going out of the light into a dark room unless accompanied by a familiar adult. She will, however, run first into the dark house on returning home after dark.

B never showed anything which was unmistakably fear of the dark, though once at 4; 11 after he was in bed, he cried because the blind was up and said he did not like the 'light mixed with darkness'. Even at 4 years of age B would get up and go downstairs if necessary in the middle of the night alone: and sometimes, waking in the dark, would go downstairs to see if we were still up, and would go back to bed in the dark without disturbing any one, on finding we had gone to bed. This may be exceptional, though I have a similar note of Y at 7; 1.¹ It may be worth mentioning that B certainly showed exceptional physical courage during adolescence—plunging readily through enormous breakers, for example. Brother officers reported that in the retreat to Dunkirk and on the beach he showed remarkable coolness under fire, and for this he was subsequently 'mentioned in despatches'.

X at the age of 5 showed fear accompanied by *vivid imagery* which appeared at night after she was left alone in bed. She 'saw' what she described as horrid things, 'Cabbages all round the room—and a girl going out of the window.' She would come downstairs crying and for some weeks it was difficult to get her to go to sleep. (This is the child who at 3 and 4 years showed extraordinary lack of fear of the sea and of horses, cows, and dogs.)

The experiment was tried when she was 5; 7 of putting her elder brother to sleep in the same room. My notes record:

X now says she sees only nice things at night, though she does not know why. The horrid things have disappeared since her brother went to sleep in the same room.

These facts suggest that the rousing of the specific imagery at night was due to fear, and not vice versa.²

Of course I am not suggesting that such vivid, visual imagery may not occur without fear. I have no doubt it does, and in the

¹ Mrs. Harrison reports that A. H. showed similar fearlessness in the middle of the night at 7; 0.

² It was about the same age as X's—5 years and onwards—that Dr. W. Boyd's little girl 'saw' things at night (e.g. green eyes), a little earlier (4; 3) she heard 'breathings'. (See his article, 'A Child's Fears', *Jour. of Exper. Ped.*, V, 1919, p. 130.)

case of X and of A (when somewhat older) 'nice' visions were sometimes experienced. Y. H. also saw 'nice animals' at 4;3 when going upstairs alone, even with the light on.

A also experienced very vivid imagery at night at one period, about 5 years of age, in particular being obsessed by images of 'raw meat', explicable perhaps by the fact that after a serious illness at the age of 1;0 he had to eat a good deal of raw meat.

C never showed signs of real fear of the dark itself in these early years, though at about the age of 7 he preferred to have his bedroom gas lit for him.

Though this boy never showed the strong emotion that X did in her night terrors he did report similar horrid imagery at 7;7. He said he sometimes saw very horrid things, but he 'stared at them and made them turn into nice things'. (Generally speaking, this boy, C, was more equable in several ways than B or X, showing less exhilaration at joyful happenings, and less depression at disappointments, though B, as noted before, showed even less of fear than did C.)

One general fact about fear of the dark seems probable, namely, that at least it does not appear much less frequently with increasing age, up to the age of 5;0 or 6;0. Our own records above suggest this; and in the inquiry by Jersild and Holmes the number of children reported by parents as being afraid of the dark (or of being alone in the dark) were as follows: age 2;0 to 3;0, 5 out of 45 children; age 3;0 to 4;0, 4 out of 46; age 4;0 to 5;0, 2 out of 22, and of the small 5;0 to 8;0 group, 2 out of 9 children.¹ Another general fact is that there seem to be great individual differences as to fear of the dark, even greater than appear in other types of fear.

Individual differences. The last section again emphasizes one fact which will have been very evident throughout this chapter—the marked differences between individual children. In view of the fact that innate fear reactions, while biologically useful in general, are hardly essential when parents will protect the child from danger, we should expect considerable innate differences. In view also of the liability of suggestion causing fear we should expect further differences, according to experience and training.

Some children, as we have seen, show very little fear: others are reported by a child psychiatrist as being 'literally always afraid of everything'—(scarcely a state that could be due to specific 'conditioning' by the way).²

¹ Op. cit., p. 51. Also in an experiment with a dark passage the percentage of children showing fear increased after 2;0 and remained about the same up to the age group 4;0 to 4;6 (op. cit., p. 225). After 5;0 it disappeared.

² L. Kanner, *Child Psychiatry*, p. 293.

Playing at fear. The last point I want to refer to is the tendency to play at fear, to enjoy games in which fear is roused. The first notes illustrate the alternation of fear and pugnacity.

B, 2; 7. Playing at my being a lion, M protecting me. When I caught him and roared he cried violently and looked alarmed. Yet at the end he said, 'Gain,' and so twice. (Later.) When playing at lions, B buries his face in M's knees. Once his attitude changed suddenly and he began to hit out at the 'lion', crying, 'Go away.'

2; 7½. In playing at lions, if he starts off on the offensive he is not afraid, but if he pretends to fear for a time then he becomes afraid and cries.

There are repeated notes of this kind. So with:

A, 3; 2. Came back to top of stairs four or five times for the fright I gave him by growling and rushing at him. He screamed and ran away each time, but returned. Again B at 3; 5 repeatedly asked me to bury him beneath the bedclothes, though each time he seemed very frightened and cried.¹

Y, 3; 5. I played with her by sliding her over couch back, holding her by the legs. She laughed while I let her down and screamed as I pulled her up, and cried 'Don't you like it?' She replied 'Yes, but it frightens me.'

Y's introspective observations in the next year or two make me less surprised than I might have been at this realization on her part of the complexity of her experience.

It is interesting to contrast the occasional pugnacious facing of the feared object shown by A and B with a quite different way of meeting the situation shown at times by C and Y. I have already recorded that when I crawled towards Y on hands and feet, monkey-wise, she retreated as far as possible from me, and then bent and kissed the top of my head. Similarly

C, at 3; 10, when I asked him if I should roar like a lion, said 'Yes,' but when I did, he half cried and shouted, 'No, Daddy,' rushed to me, and kissed me vigorously. This response has followed several times since, when I have roared again; but if M is present he flies to her.

This playing at fear seems to imply a craving for the stimulation of fear, and agrees better with the assumption of an innate tendency than with the idea of fear as merely a conditioned reflex.

The gradual differentiation of expressions of fear. In concluding this chapter I may call attention to the way in which new and more specific expressions of fear appeared. There were, first, the loud cry and the jerky starts of the whole body and the throwing

¹ Professor Carveth Read told me that his little brother used to ask him to make 'horrid faces' and then would scream with terror, only to ask again, 'Do make a horrid face, a very horrid face.'

up of the arms at a sudden loud noise, and similar general excitement plus grasping at support when experiencing falling; then the cry seems to be differentiated from the cry of pain in hunger. Then about the second month came blinking at a loud sudden noise, and later a trembling of the lip (at least by 0;3) and squaring of the lips. More characteristic facial, bodily expressions appear. Later, when control of movements has developed, there is a turning away of the head, tentative touching and hurried withdrawal. Later there appeared trembling or shuddering of the whole body—an apparent reaction or general response of the whole body, but in reality a type of response especially associated with fear, though not exclusively with fear, as trembling may occur with anger. These are all expressions of what we hope was never extreme terror, under which many other expressions are known to occur such as the rising of the hair of the head. It is of interest to note that, while the sudden lifting of the arms did not occur after the early months of infancy, Darwin records its occurrence in an Australian in extreme terror.¹

Summary of Results and Conclusions

(1) Though loud sounds usually cause, in infants of a few months of age, reactions suggesting fear, they do not invariably do so.

(2) Novelty is at times a factor in determining whether a sound causes a fear reaction. But not all novel sounds cause fear.

(3) Qualitative differences between sounds, e.g. the high or low pitch of piano notes, may determine whether a fear reaction follows or not.

(4) The earliest responses (from 2 or 3 to 6 weeks of age) to loud sounds resemble those to sudden jars, and include reflex responses, such as the jerking of the hands upwards.

(5) No fear of the dark was revealed before 25 months; but infants, like adults, seem particularly susceptible to shock resembling fear-reactions when just falling asleep.

(6) Conflicting reports as to fears of infants may sometimes be due to differences in the general conditions of the child at the particular time, e.g. the presence or absence of the mother may determine whether anything will cause fear.

(7) In some children, the absence of fear of repeating a painful experience, is remarkable.

(8) The sudden appearance of fear of dogs seems inexplicable by any suffering caused by them; and the noise of their barking had been familiar from early infancy. The fear of some other animals is still less explicable by noisiness.

¹ *The Expression of the Emotions*, p. 309. (2nd ed., London, 1889).

(9) Watson's experiments establishing 'conditioned fears' in an infant at 11 months do not disprove the existence of innate fear tendencies; for the maturing of some of the fears seems to take place only towards the end of the second year.

(10) Some experiments of the writer showed that a loud noise, in itself undisturbing, helped to cause a decided shock and distress when sounded in the presence of a strange insect.

(11) The special susceptibility to suggestion of fear and distress when in the presence of some strange animals (as shown by Watson's observations, as well as the present writer's) indicates the presence of innate fear tendencies.

(12) Observations prove a fear of the 'uncanny' which cannot be explained by unpleasant past experiences.

(13) Fear of the sea also appears in some children quite independently of any suggestion or unpleasant experience.

(14) Fear of the dark never appeared in one of the children observed, and in none during the first two years; it appeared in two to a marked degree at the age of 5 years. But children may be very suggestible towards fear of the dark.

(15) Several children were observed to enjoy 'playing at fear', even to an extent which eventually caused screams and tears. This suggests an innate tendency craving for stimulation.

CHAPTER XII

Genetic Psychology of Laughter

Some famous theories of laughter. The best known attempts to explain laughter suffer through over-simplification: they select one aspect and give an explanation which may be true as far as it goes, but fails to explain all types of laughter.

The genetic study of laughter suggests that there are a number of different causes of laughter. Indeed, the biological point of view would itself suggest this. For why should there be only one explanation of laughter? Nature has arranged that some organs shall be useful not only for one but for several very different purposes. For man, the hand proved useful not only for grasping food but for climbing trees, for swimming, and for holding a cudgel to fell an enemy. Also, nature has provided often only clumsy and untidy adjustments, some of which overlap, and some of which are futile: for example, the occasionally useless functioning of the maternal instinct in monkeys is shown by the fact that the mother sometimes carries a dead infant about for several weeks after its death.

Laughter seems to be often a useful activity but not always of essential biological value. Its frequency varies greatly in different individuals. Some laugh much, some hardly ever (Dr. Johnson says Pope and Swift never laughed); and this variation has been found to be true of infants from 3 to 12 months, even when in good health.¹

Laughter seems to be but loosely attached to any particular feeling. Some people 'giggle' at the slightest cause. Laughter and tears are notoriously linked in some circumstances, and sometimes a little child seems hardly to know whether to laugh or cry. So we must not be surprised if laughter should sometimes seem valueless or to have wandered out of its proper place.

I will first mention briefly a few of the main theories to which I shall refer later and each of which contains a valuable truth.

The philosopher Hobbes refers to laughter as expressing 'the sudden glory arising from a sudden conception of some eminency in ourselves, by comparison with the infirmity of others, or with our own formerly'. This does seem to be true of some occasions of laughter—though the word 'conception' is too intellectual for

¹ See Ruth W. Washburn: 'A Study of Smiling and Laughing of Infants in the First Year of Life' (*Genetic Psychology Monographs*, Vol. VI, 1929).

the feeling of elation which seems occasionally to be a cause of laughter in childhood, as we shall see.

Herbert Spencer's theory is a physiological one—laughter is due to an overflow of surplus nervous energy. It is true no doubt that there is some release of energy, but the main question is 'What are the special conditions?' Darwin naturally takes a biological point of view: he regards laughter as an expression of joy, which he says is shown even by apes.¹

Bergson's main idea is that anything mechanical in human behaviour is comic.² Laughter is a social gesture at a man who shows inelasticity. This seems true so far as it goes. But Bergson's view seems to be incomplete, and involves him in some statements hard to accept: for example, that laughter is always the laughter of the group. Bergson says we do not laugh at jokes we hear told by strangers at our hotel table; like the man who, in church, when the sermon was emotional and profoundly moving, did not weep when others were weeping, and when asked why, said 'I don't belong to this parish!'

McDougall rejects the view that laughter is expressive of pleasure. We are pleased, he says, *because* we laugh: we do not laugh because we are pleased. The ludicrous and absurd are not pleasing: on the contrary, they are things that would annoy us if we did not laugh. McDougall stresses the fact that it does us good to laugh: it stimulates circulation, raises blood pressure, and sends blood to the brain. Also this drainage of energy prevents it from being otherwise used. In laughter at the ludicrous, as when a fat man has to chase his hat which has blown off, there is always some misfortune which would distress us if we did not laugh. Thus for McDougall, laughter is nature's defence against wastage of sympathy over small discomfitures.³

I believe that this is a service sometimes performed by laughter. Yet I think the facts will show that, in its origins, laughter is expressive of pleasure and not merely creative of pleasure.

Freud disclaims any comprehensive theory of laughter. His theory of wit is that jokes are of two kinds: first, harmless wit, which aims only at pleasure—the essential element being 'economy of psychic energy'; second, wit having some additional tendency implicit, e.g. obscene or aggressive. These tendentious jokes allow a repressed thought to come to the surface which could not do so otherwise. For example, take the following story: A doctor is called in by a husband to see his wife who is ill. The doctor, after seeing the patient, says, 'I don't like her looks.' *Husband*: 'I haven't liked her looks for a long time.' According to Freud,

¹ *Expression of the Emotions*, p. 134.

² See his book on *Laughter*.

³ See his *Outlines of Psychology*, pp. 165-7.

this joke should be laughed at most by disappointed husbands, bachelor woman-haters, or jealous spinsters!

The beginnings of laughter in infancy. Let us now see how laughter begins in the child: perhaps I may state here that I started my observations with no special views as to a theory of laughter.

(1) As I shall presently indicate that laughter first appears as *an expression of pleasure and delight*, it is desirable to recall the very first appearances in the infant of what seem to be expressions of pleasure, described more fully in Chapter VII.

As we saw, the first signs of pleasure which I noted were grunts or 'gurgles' after food or a warm bath, occurring by the end of the second or third week.

The other earliest sign of pleasure was the smile. The study of smiles is not, I think, irrelevant to a discussion of laughter, as some psychologists have maintained. For the same situations tend to produce smiles as produce laughter. Also laughter often dies down, leaving a smile. This is due, McDougall says, to the pleasant effect of laughter; but laughter often begins with a smile which breaks into a laugh; furthermore, in experimental tests I have found a joke produce a smile in some persons, but laughter in others. Again, Miss R. W. Washburn in her *Study of Smiling and Laughter of Infants* already referred to, found that, in the group of fifteen infants the order of the appearance of the causes of smiling and of laughter were remarkably alike—the correlation being about 0.8.¹ The occurrence of smiles in the first two months was dealt with in Chapter VII, and here I need only recall that not only my own records but those of several other careful observers show that the first certain smiles are either expressive of comfort and pleasant sensations, or responsive to a smiling face. Precisely the same causes, we shall see, produce the first laughs.

Contented sounding chuckles or gurgles were noted in A, B, C, and Y from the ages of 4 or 6 weeks, when they were held by the mother in the position for feeding. Some might have even called these chuckles a primitive form of laughter, though I should hesitate to do so. (Professor Dearborn noted as early as d. 19 an 'audible laugh' by his daughter when she was nursing.)

What I thought the first unmistakable laugh of B's—on d. 39—was also connected with feeding, presumably the main source of strong pleasure at this stage. Precisely similar circumstances marked the first suggestion of a laugh in Y on d. 29, in C at 6 weeks, and in A at 7 weeks—a similar order to that of the development of speech.

As the cry is the sign to the mother of need or pain, so the

¹ Op. cit., p. 491.

smile or laugh at a primitive stage may have had some social value in indicating to the mother the satisfaction of the child.

I feel confident that, in the case of these five children at least, a crude type of laughter first occurred as an expression of exuberant delight at the satisfaction of feeding, though Y's expression at the early age of 4 weeks was not so obviously laughter as was her response to laughter at 7 weeks. The first laughs recorded by observers of other children were noted only at a slightly later period, when another stimulus had already begun to operate.

In view of this first appearance of laughter in connexion with feeding it is interesting to recall that Darwin observed in apes something very like smiles and laughs when they were fed; and Yerkes definitely speaks of 'pronounced laughter' in his pet chimpanzee and asserts that in the male chimpanzee 'the smile laugh more frequently occurs in response to favourite foods, in play'.¹ Hoffding remarks that idiots laugh especially when food is given them, when caressed, or when hearing music.²

Quite recently in the London Zoo I watched a chimpanzee receive a much-favoured food from a visitor. The ape sprang up to his shelf and before beginning to eat uttered some loud grunts and guffaws which vividly reminded me B's happy grunts when about to be fed.

Very soon after these beginnings of laughter, it seems to be associated with general bodily welfare. Notes made on B from 0; 2½ by his mother independently contain several items like this: 'Left him in his cot where he laughed and talked to himself quite happily.'

Indeed, examples of the laughter of pure delight in physical well-being or in pleasant sensations, continue for a long time in infancy, for example, at the enjoyment of a hot bath or of warm sunshine.³

(2) The second type of laughter I noted was *laughter responsive to the laughter or smile of another* which I noted in B at 10 weeks (in response to his mother's face), and in Y at 11 weeks in response to my laughter.⁴ Several other observers record such laughter also at about 2 months. So laughter is almost from the first very suggestible and bound up with social relationships. Not, of course, that it always follows or that strangers can produce it. Miss Washburn, though she found 'social stimulation' the earliest cause of laughter, only obtained it twice herself among the fifteen infants

¹ Yerkes and Learned, '*Chimpanzee Intelligence*', p. 32 (Baltimore, 1925). ² *Outlines of Psychology*, p. 291 (London, 1904). ³ Cf. K. C. Moore, op. cit., p. 38. At 6 months: 'good health and high spirits found vent in loud laughter and occasional screams'.

⁴ In W. D. Wall's J smiling in response to a smile was 'certainly established by the 7th week.'

tested: but the mothers reported that it occurred at home. And again there are great individual differences: for example, I noted that even by 18 weeks A only *smiled* in response to laughter, and at 20 weeks had never been noticed to laugh in response to a smile. A was generally more placid than B or Y; it was noted at 12 weeks that he cried and laughed very little.

So strong in some infants is this tendency to laugh in response to laughter that it may even be effective in the midst of crying. Thus of B at 0;4 I noted 'Responsive laughter occurred even when he was crying. Repeatedly laughed when his mother or I laughed at him.' This inhibition of crying by a suggested laugh I noted also in Y at 3 months and several times in others of my children, but especially in B. He was, I think, exceptionally prone to laughter.¹ At the age of 0;4, for example, I noted 'Much laughter these days. Laughter was even roused by a smile.' And also at

0;4. Laughed uproariously and continually in response to M's laughing. Laughed repeatedly when his mother spoke smilingly to him while he was nursing. Laughed even in response to a smile.

I think that B in later months and indeed in later years showed an unusual tendency to join in laughter at his own expense. I noted for example at the age of 0;8—'Does not cry when laughed at: he was crying bitterly himself because something was taken away from him and when we laughed at him, he laughed too'. It may be that a strong tendency to laugh in response to another's laughter is one factor encouraging laughter at oneself, but it does not seem to be an essential cause, for one may laugh at one's own error when alone.

To return to the general point, the infectiousness of laughter even in adults is well known. Laughter need not even be seen to be imitated. I have seen people, when listening to the wireless, laugh in response to the laughter heard, even when they could not hear the jokes.

Smiling during the period 0;2 to 0;4. Before proceeding to the third type of laughter, a few notes should be quoted as to smiling during this period of 0;2 to 0;4.

d. 82. A was taken to a looking-glass and his eyes lit upon his own face. A smile followed after about three seconds. So later, twice. Later on he found my face and smiled again.

Why the smile at his own non-smiling face? Possibly it was an amusing surprise, though the age is very young for this; more

¹ Dearborn also notes, of his daughter at 0;6 that some one made her laugh aloud in the midst of loud crying; she also appears to have been a very merry little maid (op. cit., p. 84).

likely there is here revealed an innate tendency to smile at a human face, even if the latter is not itself smiling. I have various notes as to B smiling at his mother's face or mine, but without a definite note that we were deliberately avoiding to smile. But Y about the same age would certainly smile at a non-smiling face which was familiar. Thus :

d. 61. I was talking to M but not smiling, as I stood above her, Y being on her knee. I glanced at Y and discovered her smiling at me : later I noted the same as I sat and wrote.

This observation was repeated a few days later.

d. 70. I was sitting talking to M (not smiling) : I suddenly looked at Y and found her already smiling at me. Later as she lay in bed I went and looked at her, deliberately without smiling. After a few moments (ten or twenty seconds) there was a distinct but faint smile : and after a similar or longer interval, another. I then smiled at her and almost at once there followed a much broader and happier smile.

Such smiling at the non-smiling face of the father or mother might, however, even at this early age, be due, not to mere familiarity, but to pleasurable associations of play or feeding or other comforts with the face or voice. For association between position and the proximity of food seems already to have taken place before this period ; by d. 22 and d. 27 the contented gurgle after food or bath had become an 'anticipatory chuckle' on being placed in position to feed or having a napkin tucked under his chin. On the other hand, other observers have found that at 3 months (and less often at 4 months) infants will smile even at an angry face.¹

Certainly the human face does seem to have a strange fascination for the infant in these early weeks. On d. 10, as soon as one could be certain of the child's power of fixating his gaze, I noted

'B seems more interested in my face than in the silver scent bottle—perhaps because of mobility'; and on d. 11, 'Great interest in new faces, looking over his shoulder long at Mrs. D.', though 'later did not follow a moving candle light'.

(3) Another stimulus causing laughter about the same time was the sight of a *bright or pleasing object*. At $2\frac{3}{4}$ months B laughed with pleasure at the sight of a silver rattle. Dearborn and others report similar laughter, Preyer found 'loud laughter at objects that please still frequent in the ninth month'.² This is perhaps a

¹ See Charlotte Bühler, *Kindheit und Jugend*, p. 30, Dritte Auflage (Leipzig, 1931).

² *The Senses and the Will*, p. 299. Major noted smiling at brightly coloured tassels at 0;2 (op. cit., p. 78).

special case of laughter expressing joyful exuberance. But it is certainly not laughter at something which would displease if it did not cause laughter!

(4) The fourth type of laughter I observed in order of appearance was that caused by *tickling* or jogging, which is so familiar that I need hardly illustrate it. An Oxford student researching on the behaviour of animals, and who knew some of the apes in the Zoo well, told me that even chimpanzees laugh on being tickled, especially the females.¹

At 0; 3½ B 'laughed aloud when M kissed his feet. Tickling in the ribs caused loud laughter' and so with A and Y. Preyer got laughter by tickling the sole of the foot as early as the 8th week.² An experiment was done with Y at 0; 5 especially to see how far laughter, at tickling was a purely physiological reaction. It was found that Y laughed when M tickled her on the chest so long as M was smiling, but Y ceased to laugh when M forced herself to look solemn, though the tickling went on. I re-tested this, and found it true again. Then I covered M's face while she tickled Y: result at first some laughter though not so boisterous. The second time when M's face was hidden Y looked at me and did not laugh, though still tickled. The same negative result followed on another occasion when I tickled her but refrained from smiling. But the violent reactions to tickling and a smiling face combined indicate that the tickling is a strong factor in producing a much greater reaction than is usual merely to a smiling face. This will be referred to again later.

(5) Next we come at 0; 4 to a *mild shock or surprise* as a cause of laughter, one, however, which is too slight to cause fear.

Thus B laughed when I suddenly tore a newspaper. (This occurred on three different occasions.) It is notable that this was precisely the noise which, some days earlier, caused an apparent start of alarm. There is perhaps now still some surprise, but with the fearful element removed.

(6) The essential mark of the next cause of laughter is *Repetition*. This appears at 0; 6.

d. 180. Peep-bo game. I was covering and uncovering my face with a sheet. First a smile from B, then slowly increasing laugh as before.

This is typical of many occasions when a first occurrence of a stimulus causes only a smile or perhaps signs of wonder, and only after several repetitions is laughter produced. It is true that if one is smiling at the child at the same time this acts as an additional

¹ Darwin states that young chimpanzees laugh when they are tickled. *The Expression of the Emotions in Man and Animals*, p. 134.

² Ibid., p. 225.

stimulus. So I three times tried an experiment with Y at 0; 6 in which I deliberately avoided smiling as I bobbed round from behind her cot curtains—and Y only smiled each time. Nevertheless, it remains true that mere repetition sometimes increases the smile or changes a smile into laughter and sometimes changes a look of wonder or of slight alarm into a laugh. I have produced this effect even with a baby of 0; 4 to whom I was an entire stranger. As she lay in her pram I bent over her, and carefully avoiding smiling, made a noise by shaking the lips. There was on the baby's face first a very earnest expression; then after two or three times a smile and finally a gurgle like a little laugh. Similarly with a friend's child O. T. at 0; 4½. At first a sudden noise I made by shaking my lips caused a start—one arm being thrown up, the other outwards: then two repetitions caused no start, but a look of wonder. On the next repetition of the noise came an unmistakable laugh. Miss Shinn noted at 0; 5½ 'Pop pop pop' on d. 162 produced at first only a wondering stare, but later a smile.¹ Miss Washburn also found that the game 'peek-a-boo' in which the experimenter's face was suddenly uncovered, began to cause laughter in some of her fifteen infants at 6 months.²

Laughter at mere repetition is a puzzling and perhaps an important fact for a theory of laughter. It seems probable that on some of the occasions on which a laugh followed a stimulus after several repetitions, the first occurrence of the stimulus produced a slightly unpleasant shock or disturbance. As remarked, sometimes there was an obvious start, but sometimes there were merely signs of wonder. As this shock should disappear with repetition, laughter may be an expression of the pleasure of relief.

But such relief does not seem essential for laughter at mere repetition, which seems to become even more certain as the child gets somewhat older. Thus,

Y, 2; 6. I tried an experiment to see if mere repetition could produce laughter. I said to her, as she was playing by me, 'Babble'; there was no response. I repeated 'babble' at short intervals, being careful not to smile. After five or six times she replied 'Daddy', and so on several times, Y beginning to chuckle and finally breaking into a decided laugh.

2; 11. Y pulled a desk slide out; I pushed it back, and so on. After a third or fourth time a slight chuckle, and later loud laughter.

There is certainly a suggestion of the 'mechanical' in human behaviour (to use Bergson's term) in the monotonous repetition of actions in some of these games or experiments. But it is scarcely credible that there is any apprehension by the infant of 0; 6 of

¹ Op. cit., Vol. I, p. 112.

² Op. cit., p. 473.

the absurdity of such 'mechanism'.¹ Laughter at repetition then may be the appropriate description of some of the types of laughter discussed by Bergson.

Laughter due to mere repetition certainly seems to occur in adults. A comedian says 'Now we shan't be long' or a politician says 'Wait and See' once, and nothing happens—often in more senses than one! Later repetitions bring smiles and finally loud laughter. It is the six-months-old-baby reaction!

(7) Another cause of laughter at the same period was *the comic or incongruous*: the occurrence of something familiar in a novel setting. Thus at 0;6 B laughed greatly at seeing his father or mother in a paper cocked hat: and at my falsetto voice. Dearborn states that his daughter laughed when her mother said things to her 'in a funny way' as early as 0;4.²

At 0;9 'As B would not drink his bottle of milk I pretended to drink it. Instead of minding this he roared with laughter and when I put it to his mouth again he took it out and put it to mine.' At 0;8 his mother imitated one of his high squeals, and he repeated it, and then she imitated him again, at which he would laugh and squeal again and so on for at least thirty repetitions, until his mother gave up.

Here the cause of laughter may be partly the perception of the incongruity of his mother squealing and partly the effect of mere repetition.

Laughter and play. It is difficult to separate some incidents of the kind just described from 'play situations' in which they are absent. Mere play is given by some psychologists as a cause of laughter in children, and certainly I often saw laughter when a child was being 'played with' by the mother or myself. At the very early stage, say 2 to 4 or 6 months, such play may take the form of just talking laughingly, or the bobbing of the mother's head towards the child. But here the mother's own laughter may be an adequate stimulus, and indeed in any social play it may continue to be at least a supplementary cause of laughter.

From about this 6 months' stage, some adult actions may, it seems, appear ludicrous. This may be a factor (as well as the laughing mother's face) in the situation which Miss Washburn found the most dependable stimulus of laughter (among those she employed) after 0;4, namely, wagging the head and suddenly

¹ I think also repetition of mechanical stimuli may cause laughter. I have no exact data of this but, as mentioned above, such stimuli as the tearing of paper at first caused a start and an expression almost of fear, but later, on several repetitions, a smile or laugh. At a later period a Jack-in-the-box may produce similar effects. It may be that here the smile or laugh is one of relief.

² Op. cit., p. 58.

bobbing it forward till it bumped into the baby's abdomen, meanwhile crying 'ab-boo'—repeating all these at least three times. In this typical play with infants it will be seen several factors may play a part: (i) a ludicrous yet friendly action, (ii) a smiling face, (iii) tickling (on contact), (iv) an unusual sound, (v) repetition, and sometimes (vi) the general delight in the mother's presence. Even then, one child among the fifteen, Miss Washburn observed, never responded with laughter; and negative responses increased after 0; 10.

It seems clear that the 'play situation' may at times be associated with laughter as an expression of the mere joy in friendly human companionship and attention. (Dearborn noted that his daughter (at 0; 4) laughed 'loud and long' at the return home of her mother.)

Later, as we shall see, exciting games may produce much laughter, but often there is a conflict with mild fear, or triumph at a new accomplishment. Thus it is difficult ever to eliminate all other possible causes than play. (We shall refer directly to play and laughter after 2; 0.)

If we do not assume that a mere 'play' situation may be laughable, then even mere *imitation*, it would seem, may cause laughter. Thus:

At 0; 9, B waved his hand and M at once imitated. B laughed and after a few seconds waved again; again M followed and B laughed, and so on repeatedly.

Now there can be nothing incongruous in the mother waving, for she was constantly doing so to B. Dearborn also observed laughter (at 1; 2) at the 'humorous imitation of persons' remarks'.¹

Bergson regards imitation as a type of mechanism and so essentially comic. The mere comparison of two similar faces is amusing. Freud says Bergson's view here fits in with his own formula, because repetition 'economizes psychic energy'. We are prepared by knowledge of human nature for something changing. Then imitation makes this new activity unnecessary.² Possibly, however, this laughter at imitation is a special case of laughter due to repetition.

(8) We come next (at 0; 7) to a suggestion, but a doubtful one, of *laughter at mere recognition*—of the child's own name, or of his own face in a mirror. Other observers have noted this kind of laughter. It will be recalled that between 0; 2 and 0; 4 both B and Y smiled at familiar faces, even when they were not smiling faces. Now of B I noted: B, 0; 7. 'Laughed several times at "Ba-ba" and not at other words.' I must explain that

¹ Op. cit., p. 148. The laughter (at the same age) at the imitation of animals' noises might rather be regarded as laughter at the incongruous.

² See *Wit and its relation to the Unconscious*, p. 337-8.

'Ba-ba' was the name by which he was called. But this is an isolated note and the test, if repeated, is not referred to again. Was it a pleasure in recognition? It should be compared with an observation made by Miss Shinn (d. 149) that 'Pa-pa' or 'Ba-ba' caused laughter, but that the same broad vowels with other consonants did not. This was after 'Pa-pa' had been constantly said to the child to familiarize her with it early.

I regard the evidence for a special classification of laughter at mere recognition as very doubtful. It is always possible that a word constantly repeated by a loved voice comes to have a comforting pleasing sound, just as the face of a mother comes to 'mean' comfort and that of the father, fun. Freud states that recognition is generally thought to be pleasurable. He also refers approvingly to Karl Groos's view of the original pleasure of re-finding the same thing.¹ But surely there must first be some puzzlement or a felt problem.

(9) The next type of situation which aroused laughter was that in which the child accomplished some *new form of activity*.

0; 7. A loves to lie on the floor and then holds himself right up on his arms and looks round laughing.

1; 1. B stands alone for about thirty seconds; then collapses laughing. 1; 1. B kept standing up in the middle of the playground and then raising hands high above the head, with a laugh, though the movement often made him fall.

2; 0. Y seen several times lately to laugh when she accomplishes some new feat.

Such laughter may be regarded not merely as an expression of general exhilaration but as due to the satisfaction of the desire for power. It seems to be the first example of that feeling of 'sudden glory', which Hobbes regarded as the great cause of laughter, due to a sense of superiority over the child's own former accomplishments.

(10) The tendency to tease and to *laugh while teasing* was noted as early as 1; 2½.

B teased his mother this morning when she wanted to take something from him by holding it out, saying 'Ta, ta,' and then dragging it away when she tried to take it, and laughing until he almost collapsed. This was repeated three times until M took it by force.

B at 1; 9. Great merriment and much laughter caused by little joke of his own at my (M's) expense. Tipped his head back and his bottle straight up in the air. Went into such merry peals of laughter that I couldn't scold him. A few minutes afterwards, when put into bed, he wanted to kiss a chair. When I held it up to him, he flung himself down

¹ Op. cit., p. 339.

in bed and pretended he was going to sleep. When I put the chair down, up he sprang again and wanted to kiss the chair. Teased me like this a long time, laughing hugely.

It is possible that such laughter while teasing another is partly laughter of the type to be considered next, namely, laughter at the slight discomfiture of another. More probably I think it is due partly to the perception of the incongruity of the superior parent being overcome, and partly to delight at the power over another.¹ Shortly after this time and especially from the fourth and fifth year onwards, any game in which the infant would seem to itself to gain a victory over a parent or older child, produced hearty laughter. In the later years possibly repressed tendencies are here released and accentuate the laughter.

(11) Only at 1½ years, after eight or nine other types of laughter have appeared, do we come to a clear case of *laughter at the sight of the mild discomfiture of another*; and that needed a very obvious discomfiture.

Thus at 1;4 B always laughed when his mother pretended to cry!² Once when she was really hurt by his head banging her lip, B laughed. A loud roar of laughter came from B at 1;5 at the sight of his mother tumbling down a grass bank—which she did in order that we might get a photograph of B's hearty laugh. Laughter at M's pretence of crying was noted again at 1;8. Even such laughter might be partly due to some perception of incongruity: but possibly we have here a genuine example of laughter of the type described by McDougall.

It is possible that a few laughs at the slight misfortune of another may have appeared before the period mentioned. It seems clear, however, that they did not occur until after the first half-dozen or so fundamental types of laughter had appeared. Previously, sympathetic distress seems to predominate. Thus at 0;10 B cried when M cried out with pain at hot water falling on her foot. A at 1;3 cried when hearing another child cry. As early as 1;0 Y laughed when M pretended to cry (I thought rather well) but at 1;2 and 1;4 Y cried and showed great distress when another child cried.

Laughter at the sight of another's distress seems to depend upon varying degrees of maturity, according to the type of distress.

¹ Sullys' explanation of laughter when teasing, as due to the sheer enjoyment of playful activity, is not inconsistent with my suggestions above, but does not seem to go deep enough. (See *An Essay on Laughter*, pp. 201 ff.)

² Dearborn reports that his daughter, at 1;3½, laughed at a photograph of herself crying, and indeed always laughed at the picture of a crying child (op. cit., p. 159).

For example, one investigator found that while pictures of boys being spanked caused general laughter among 6-year-olds they did not among children somewhat younger.¹

(12) From about 2;0 onwards *laughter in the course of play* is very frequent. Such play is always social—that is, another person is involved, except in the kind of triumphant playful exercise of a new accomplishment, already referred to. It sometimes seems to express excitement which is partly pleasurable in conflict with slight fear, e.g. screams of laughter at being chased round the room, when I was playing at ‘lions’ with them. In this latter case, when the child was caught, laughter would change (as we saw in the last chapter), to screams of fear and tears, only to be replaced in a minute or less, when the child was comforted, by demands for more games of lions, and by more laughter.

At other times of play fear can hardly have entered in. Thus

Y, 2;3. Screaming with joy over nothing more exciting than getting hold of M’s watch on her wrist: M supposed to be trying to avoid it.

In this kind of play, however, there would be some delight in overcoming the opponent, a cause of laughter already dealt with.

It seems doubtful, indeed, whether laughter at the pleasurable excitement of social play deserves separate classification; for several, if not most, of the types of laughter already mentioned would be accompanied by pleasurable excitement—including one of the earliest—the pleasure at anticipation of food.

(13) A curious thing was noted of Y at 2;11. ‘When she has done anything naughty she makes up a hearty laugh to make her mother laugh.’ Now there seems to be some truth in the James-Lange theory of emotion so far as laughter is concerned. Even though we sometimes laugh because we are pleased, yet, as McDougall says, ‘we are pleased because we laugh’. Y no doubt hoped by laughing to make her mother laugh and so put her in a more friendly mood; and here we seem to have the beginnings of a new form of artificial laughter as a social medium of approach: and a side-light on the social value of the smile on greeting a stranger, and on the ‘nervous’ laugh emitted by some persons on meeting another with whom they do not feel quite at ease.

(14) Laughter at *incongruity in words and ideas*, or at puns, is no doubt only a special type of laughter at the incongruous: but its later prominence in adult life makes it worthy of mention, especially as it seems to develop remarkably early in some children. Thus

¹ See F. Justin, ‘A Genetic Study of Laughter-provoking Stimuli’, *Child Development*, 1931-2. (Quoted in *Handbook of Child Psychology*, edited by Carl Murchison, p. 292 (2nd ed.), 1933).

X, 3; 6. Heard M read out of paper 'Great speech by Premier. House swept off its feet.' X looked up from her porridge and laughed and said, 'Houses don't have feet!'

(15) Soon after this time, certainly by 4 or 5 years, a child may laugh at mere *coincidences*, e.g. two people happening to do or say the same thing together. This may partly be regarded as a special case of repetition. It is a type of the ludicrous, but hard to classify with any earlier type.

This completes my list, and now by the age of about 3 (or 4) years it seems that all types of laughter in adults have appeared in children.

The continuance of these forms of laughter in later life. Because a certain stimulus can cause laughter in an infant, this, of course, is no proof that it is therefore a cause of laughter in adult life. If, however, we find that the types of stimuli that produce laughter in the earliest weeks of life have their parallel in similar types of stimuli which cause laughter in later childhood and adult life, we have good grounds for supposing that these are of a fundamental nature in the origin of laughter and that they should not be ignored in formulating a theory of laughter.

I think we may readily trace parallels in adult life to each of the causes of laughter just enumerated. We will consider them in the order of their appearance in infancy.

(1) The laughter of physical *enjoyment* and mere joyful exuberance when bathing in the sea, or running down a breezy hillside, is frequently shown by older children and young people. If adults more rarely show it, the reason may be partly because we have lost that physical zest of life which is one of the charms of youth, and partly because with the association of laughter as an experience of feeling produced by higher mental processes it may become side-tracked in this way; so that most adults would feel themselves to be 'childish' if they indulged in the laughter of mere exuberance of physical well-being.

The *social use* of a primitive form of laughter expressive of mere happiness seems to come in the smile of welcome, indicating pleasure at meeting, and so, friendliness. This may break into a laugh with some people, perhaps especially with women in greeting others.

(2) Laughter *in response to laughter* is often shown as we have already remarked. A genuine laugh will sometimes stimulate laughter even in the absence of any humour, and when there is some element of humour which starts laughter, the sight of another laughing may stimulate (especially in women) almost hysterical laughter.

One writer indeed states that laughter is always social, and

as evidence solemnly observes that infants are only noted as laughing when observers are present! Several friends of whom I have inquired say they do laugh sometimes when reading *alone*, and that is my own experience, though a responsive companion undoubtedly adds a supplementary stimulus.¹

That the imitation of others' laughter, or the direct stimulation of laughter by the laughter of another, is not the sole origin of laughter is proved, if such proofs are necessary, by the fact that such blind and deaf persons as Laura Bridgman laughed. But such proof is, of course, not necessary, as such an attempted explanation would only put the question one stage further back, for we should be left with the problem of explaining the original stimulus of the stimulating laughter.

(3) The *delight in the beauty of things* around us often becomes too tempered by familiarity for it to cause such intense joy as to produce laughter. But apart from this, as we grow older, expression of all feeling becomes more restrained, and though a beautiful sight may call forth a smile it never produces a laugh.

(4) There is no need to point out that *tickling* continues to cause laughter throughout childhood and even in adult life.

(5) Of the *laugh at a simple shock* of a type which might at times cause fear, we still have examples in adult life, as, for example, the nervous laugh when we do not want to confess fear to ourselves or appear afraid to others. Such, by the way, may be explained on a defensive mechanism theory similar to that of McDougall. Another type of laughter which may belong to this group was that shown by a sympathetic and lively young lady of my acquaintance who always had an uncontrollable impulse to laugh when she heard of the death of some one she knew only slightly.

(6) Laughter at mere *repetition* among adults I have already referred to.

(7) It is unnecessary to illustrate laughter *at the incongruous* in adult life.

(8) Smiles frequently follow *recognition* of some object after a period of puzzlement. If, in adults, laughter does not also follow, it may be that here again we have lost something of the zest for intellectual discovery which the young voyager feels. But we saw that the evidence for laughter at mere recognition is very doubtful.

(9) Laughter in a child at the accomplishment of some *new form of activity* probably has its parallel in adult life in the laughter following the thrill of success, especially when conditions are stimulating and exciting. 'Strong and suddenly excited self-esteem',

¹ Professor Burt points out that in a public reading-room a reader will often laugh aloud over *Punch* and then, looking up, appear very embarrassed to find he was *not* alone.

writes Hoffding, 'easily breaks out in laughter'.¹ And this type may be regarded as the main basis for Hobbes' view of laughter as a 'sudden glory', a sudden sense of superiority not necessarily over other persons, but also over impersonal objects. This might be regarded as allied to the laughter, which sometimes appears in adults when they have safely accomplished some specially dangerous performance, in which case the conflict of fear and delight would, however, be more prominent.

(10) I have frequently noticed youths at least and some adults laugh while *teasing* children or others.

(11) The parallels in adult life of laughter at the *mild discomfiture of another* are too well known to need illustration; so much so that McDougall, as we saw, treats it as the typical form of laughter.

(12) Laughter at mere *play* is of doubtful occurrence among adults: but we saw that it is doubtful also among little children except so far as there are other complications as in (9) above.

(13) The *pretended laugh* in social approach usually softens to an artificial smile in adults: we shall refer to this again later.

(14) The special case of laughter at *incongruity of words* is, of course, very prominent in adults, and finally

(15) I have observed mere trivial *coincidences* to cause laughter in adults.

The significance of the order of development. We cannot, of course, assume that the order of appearance of types of laughter indicates the order of their importance in adult life, or shows that for adult psychology one type is necessarily more 'fundamental' than another. The proper functioning of sex comes long after a child can grasp arithmetical ratio, but it will hardly be suggested that sex is the less fundamental: neither can it be inferred that it developed later in the evolution of the species.

There are, however, some useful inferences that can be made from such studies of the order of development. If, for example, it is established, as seems to me certain, that genuine laughter of mere joyful exuberance comes long before the capacity to perceive, even vaguely, the conflict of mind and matter, or the suggestion in the living man of inanimate mechanism, then Bergson's theory of laughter as a theory of the origin of laughter, or of the basis of all laughter, seems to be untenable.

Again, if, as seems clear, the laughter of exuberance, and responsive laughter to the laughter of another, appear long before the earliest signs of laughter at the slight misfortune of another, and even at an age when such laughter is inconceivable, then a serious difficulty arises in accepting McDougall's theory of laughter as a

¹ *Outlines of Psychology*, English translation, p. 293.

defensive mechanism to prevent our exhaustion through excessive calls on our sympathy. For McDougall explains the laughter of joyful high spirits as the mere overflow of energy into a motor mechanism established for another purpose—as it may overflow by way of shouting or running, forms of expression having no more special connexions with high spirits than, he claims, has laughter. It would seem difficult, however, to understand why this form of joyful laughter should appear so long before what McDougall thinks the genuine form, if the former is simply a side appearance of the latter. A similar difficulty arises about laughter in response to laughter. Granted that an expression evolved for a definite purpose x , may be evoked by mere suggestion and imitation, even when x is entirely absent, why should sympathetic laughter appear before the capacity to respond to the 'appropriate stimulus' itself, unless sympathetic laughter is an independent innate tendency?

Suggestions towards a theory of laughter. A theory of laughter would seem to require an approach from several points of view.

Laughter first appears in connexion with the satisfaction of the craving for food. As an expression of mere joy it seems to recur throughout childhood under certain conditions, and sometimes even in adulthood. The constant laughter of some savage peoples seems to be largely an expression of 'high spirits'.¹

What is the situation when in infancy laughter occurs at the getting of food? First there is strong and fundamental craving; then comes the satisfaction of this craving or anticipation of immediate satisfaction at the sight of food or the appropriate position for feeding. At first, then, a somewhat sudden release of energy or release after strain—may be a necessary condition of laughter. At this stage, at least, such strain seems to be accompanied by a holding of breath: at the release there is a sudden setting free of the breath; and the earliest laughs seem to grow out of little gasps and gurgles of this kind.

Laughter would at this stage (as well as later) serve a physiological purpose in stimulating bodily welfare: and also some social purpose in indicating the pleasure of the infant to the mother: and later still, laughter as an expression of mere pleasure, would perform a slight social service by indicating pleasure at seeing others and, by stimulating a responsive smile, might help to induce a more friendly feeling in the stranger.

It might be said that laughter or smiling in response to a laughing face is merely a particular example of suggestion. But this exceptionally great suggestibility as to laughter indicates its special social value as a sign of friendliness, and probably, as we saw, even as a

¹ See Sully, *An Essay on Laughter*, p. 228.

creator of friendly feeling, so far as there is truth in the view that we tend to become pleased when we laugh. Here I may quote a note on B not yet given :

B, 1 ; 9. I said 'Ta' when he had some treasure in his hand : but he refused to give it me. Then I smiled merrily at him and he at once smiled and offered his toy to me.

Next in order of appearance came laughter at the sight of a bright or pleasing object. Here laughter still seems an expression of pleasure, though there was, I believe, always some novelty about the object so laughed at : so that there may have been a slight element of surprise.¹

As children get older, laughter seems to become more and more attached to a special kind of pleasure or delight—that which accompanies a sudden release of energy under special conditions. What are these special conditions ?

Suppose we consider the stimulation of a smile or laughter by a pun. Here one associated mass of ideas and feelings is suddenly linked to another, never previously (or rarely) brought in conjunction. Laughter may follow when a link or channel is suddenly provided : but it is an inadequate link—an unusual one, a channel breaking in only after some strain. Among more educated persons a laugh is only produced, as a rule, if at all, when the two 'apperception masses' are substantial ones ; but mere word assonance is often laughed at by the simple-minded.

Now we know from the psychology of the unconscious that the repression, or even the dissociation, of what should be connected, may lead to loss of energy ; and that the provision of a connecting link may mean revitalizing and a free flow of energy. Some laughter then may be due to the experience of pleasure due to a more or less sudden release of energy from the intermingling, by means of an appropriate link, of groups of disconnected ideas or impressions. No doubt the pleasure at such intermingling of disconnected ideas is increased when one set of ideas and feelings is repressed, or partly repressed. Freud has amply expounded this cause of the excessive laughter which usually attends jokes relating to sex—though it is a weakness in his theory that the loudest laughers at such jokes are sometimes those who seem to indulge in least repression !

Freud, by the way, remarks that the *maker* of a witticism does not laugh, for his energy is otherwise occupied in *making* the link. Yet this does not always seem to be true. I once saw the late

¹ Sully refers to the wives of an African King who 'expressed their delight at European works of Art by repeated loud bursts of laughter' (op. cit., p. 236). But would there not be here an element of the ludicrous ?

G. K. Chesterton, when he was sitting on a platform and making rough notes of his reply to a previous speaker, nearly roll off his chair with laughter, as he thought of new witticisms and jotted them down! Nor need the witticisms even be new: for I have also seen Bernard Shaw shaking with laughter as he watched one of his own plays. (By the way, in the case of Shaw it can hardly have been a *sudden* realization of superiority!)

So the 'sudden linking' may be provided by the mind of the person who laughs; the impulse to laugh in such a case may be less, but may be accentuated in that there is the pleasure at success or achievement, and especially if there is a victory over an opponent.

Our view as to one primary cause of laughter fits in with laughter at the ludicrous. It applies in such examples as laughter at the sight of the mother in a cocked hat. Here, however, the link is provided by actual sight and not merely by word or idea.

Laughter at the ludicrous, by the way, is one element in the laughter of ridicule—which provides a social sanction against too great a divergence from the usual. Such laughter is made stronger by antagonism (if it exists) and by the innate tendency to laugh when others laugh. So there we may have three distinguishable factors causing laughter: and a good example of 'over-determination'.

What of the other types of laughter noted? In laughter at surprise or at a simple shock which turns out to be harmless, there is a sudden change of apprehension, and also a collision of two very different feelings—mild fear and pleasure at relief, and a passing very quickly from one to the other, without a normal transition period.

As to laughter at mere repetition, in the adult there may be an element of the ludicrous in the mechanical repetition; in the child there may be some surprise at the exact repetition, quickly followed by recognition.

Laughter at mere repetition is harder to explain by our suggested theory, unless we accept the view that there is an original pleasure in recognizing the same thing. More frequently perhaps mere recurrence bores us. No doubt when mere repetition makes a child laugh there is usually something inherently interesting, and at first surprising, in the thing repeated. Where this is not the case we may say that the first repeated impressions are stored up into a more or less permanent impression. This is released or called out by a new impression which again runs to meet it, especially producing laughter when this clash is sudden. This suggested interpretation follows closely Richard Semon's interpretation of

Perception in his *Mnemic Psychology*,¹ according to which a sensation is backed up by a mnemic impression due to previous similar stimulations. This may seem a very slight thing to cause laughter, but we must remember that in the early months at least, reactions are very general. In the first weeks the whole body seems to respond to pleasure or pain stimuli. And if we assume that at first laughter is not yet fixed as an expression of fairly specific kinds of feeling, it is not surprising that it should occur very readily in children of healthy, active, laughing type. The rapid alternation of laughter and crying already mentioned illustrates this.

We saw that laughter at recognition was doubtful. But suppose it to be possible. If the mere process of recognition is pleasurable (as Freud says it is generally recognized to be) then laughter at recognition may again be merely an expression of pleasure at the sudden resolving of a problem of identity. Following the line of thought already suggested, we may say there is (1) an apparent new impression leading to a vague partial rousing of an old one: and then (2) a more explicit rousing of the old 'apperception masses' and a sudden blending of the two.

As to laughter at new performance accomplished: this no doubt is primarily an expression of joy, under excitement at success. But this may be supplemented also by the fact that there is also a sudden and pleasant solution of the conflict of (a) slight anxiety on the one hand and (b) the strong impulse to perform the act.

As to laughter at the discomfort of another, even here there is sometimes seen, especially in, say, the tripping up of a dignified, important person, a certain incongruity. This is strengthened if the repression of dislike or even mild antagonism is set free or satisfied by such discomfiture. But in this type of laughter McDougall's biological theory no doubt also holds: laughter is an alternative to sympathy and therefore a preventive against extensive sympathy.² When the discomfiture is that of a person whom we dislike the laughter is apt to be intensified. For the force of antagonistic feeling is added, and some outlet or satisfaction afforded it.

As to laughter at tickling, this is difficult to explain psychologically, and some partial physiological explanation seems to be needed. As McDougall points out, there is incongruity between (a) the slight cause of the discomfort combined with friendly approach and (b) great discomfort—which is disproportionate. But an infant of 3 or 4 months laughs at being tickled, and he could hardly perceive such incongruity. Two facts should be noted: (i) there

¹ English translation, by Bella Duffy (London, 1923).

² Expressed by Freud as an 'economy of feeling'—his explanation of humour (op. cit., pp. 370 ff.).

must be some degree of pleasantness. This seems to be supplied by the friendly play attitude of the tickler: where there is not a friendly approach we get annoyed and do not laugh. It will be remembered that my avoidance of smiling when I was tickling Y had a marked effect: and Miss Washburn herself only once got laughter through tickling her infants, whereas the mothers succeeded at every age between 0;6 and 1;0.¹

(ii) There may be laughter at the mere *prospect* of tickling; but this may perhaps be regarded as a kind of associated response comparable to a conditioned reflex.

Havelock Ellis, in spite of his recognizing the close relation of tickling to stimulation of sex areas, holds that ticklishness certainly arose from a non-sexual starting point and refers to a theory that it was defensive of vulnerable parts.²

To sum up, it would seem that *no single explanation of laughter is adequate*. A complete account seems to involve at least the following:

(1) We find laughter as an original expression of intense pleasure—with some physiological value: this continues later in childhood, but becomes rare in adults partly through loss of the physical zest of life.

(2) There is a biological value of laughter in infancy, as an indicator of well-being and as a stimulus of affection; and a biological value in later stages as a safeguard against expending excessive sympathy.

(3) Laughter has a social value among adults; sometimes as a social sanction ridiculing excessive divergence from type; sometimes as a sign of friendliness and a stimulus of friendliness in others, though this is usually expressed by a smile.

(4) There is, with the development of the child, an increasing attachment of laughter to the pleasure felt in the setting free of energy, when different feelings and later different groups of ideas are suddenly brought into relation, by an inadequate link.

(5) When repressed energy is considerable (as in sex or hatred), laughter is intensified, as it often is in jokes about sex matters (in what Freud calls 'tendentious' wit) and in jokes at the expense of those we dislike.

(6) Laughter sometimes seems to perform another service. We are familiar with the boy who, in a dark wood, whistles to keep up his spirits. The nervous laugh in a situation of danger seems to perform a similar service. As in McDougall's theory, the laughter here may inhibit not only the expression but also the feeling of fear. A similar self-defensive laugh may be that at a slight failure of oneself. I have sometimes noted a fine tennis player laugh

¹ Op. cit., p. 481.

² See *The Psychology of Sex*, p. 37.

when she made a bad stroke and failed to return the ball: and golfers *sometimes* laugh when they foozle a ball—no doubt to avoid undesirable alternative ways of expressing themselves!

(7) Finally, laughter may be due to several of the above causes combined, and so may be 'over-determined' and accentuated.

CHAPTER XIII

Suggestion and Suggestibility

The meaning of suggestion. The term suggestion is sometimes confined to the communication of a proposition which is accepted 'with conviction' through the influence of the suggestor and not on the basis of evidence.¹ A wider definition includes the causing of another person 'to accept and obey instructions', explicit or implied, 'without other motive than the simple impulse to obey'.²

Some of the phenomena of suggestibility appearing in early infancy are not mere acceptances of beliefs or ideas: or even mere responses through an impulse to obey. They include, as we shall see, processes in which the relative importance of the cognitive, conative and affective aspects seems to vary: in which at one time the prestige or personal influence of the suggestor is supremely important, there being little other motive to accept his suggestion. At other times there seems a strong impulse only awaiting suggestion just to set it off. Thus we shall be led to consider suggestion as including various ways in which one person acts upon another, otherwise than through rational argument, and so causing an action or a mental attitude or a belief. We may add, too, that the person responding to the suggestion is unaware that the reason for his doing so is the influence of the suggestion. We are thus approaching nearer to Rivers's view of suggestion, namely, as 'a comprehensive term for the whole process whereby one mind acts upon another unwittingly'.³ Rivers's insistence on the unconscious, or as he says 'unwitting', nature of the process we may accept in so far as the child is not fully aware of why he responds to the suggestion. What I have called 'primary imitation' is, however, properly treated separately; because though the imitator (as we saw in the chapter on Imitation) may be important, the interesting nature of the action imitated is often the predominant influence.

Also what McDougall calls 'sympathetic induction of an emotion' seems properly distinguishable as one type of Rivers's wider 'suggestion' and best treated separately. It may seem difficult to draw the distinction between (a), the mere 'sympathetic induction of emotion', and (b), some of the changes produced by the suggestor as indicated above, and covered better by the phrase 'change in mental attitude'. But in the latter the element of

¹ See McDougall, *Social Psychology*, p. 97.

² See McDougall, *The Energies of Man*, p. 251.

³ See *Instinct and the Unconscious*, pp. 91 ff. (Cambridge, 1920).

feeling is often very slight; and mere sympathetic induction of the emotion may take place in a dominant individual as the result of an emotion in the inferior. Nevertheless, the total process of suggestion, in the widest sense, may include as one element a 'sympathetic induction of emotion'.

Suppose we start with McDougall's assertion that suggestibility is essentially due to the impulse of self-submission. We may agree that this is the most important factor in most examples of 'prestige' suggestion; but may not affection for the parent also predispose to the reception of suggestion, though no doubt affection and self-submission usually combine and reinforce one another? Furthermore, just as the submissive impulse does not seem to account for 'primary imitation', so some phenomena of suggestion seem independent of it: for example, the results gained in Binet's experiments with line drawing, when the child, once having grasped that the first few lines increased in length, went on drawing all the lines longer and longer after the models had ceased to increase. Even if this be regarded as a special type of unconscious primary imitation, the well-known experiments with suggestive questions have also to be borne in mind. In some of these the results do not seem explicable by prestige or submissiveness, but rather by the insidious working of an idea.

If we give suggestion the wider interpretation given in the opening paragraph of this chapter and also include the modification of attitude by the influence of another, then a great part of an infant's activities in the first year are affected by suggestion. It is in this wider sense that Dearborn uses the term when he writes of his daughter at 1;1: 'L is very suggestible, doing readily every reasonable thing that one tells her to do.'¹ The motives, however, for responding to a mother's suggestions of this kind (in addition to the working of a submissive impulse) are already so complex—a delight in being noticed or a wish to be engaged socially with the mother in some activity, or a wish to please her because of mere affection—that the term 'suggestion' would lose much of its characteristic meaning if used to cover all actions of this kind. Indeed, we need hardly go further than recall the infant's love of *some* activity (especially novel) and regard the mother's suggestions as being welcomed often for the sake of a change of activity. Thus I noted of B, 1;1½, 'When he hears me say the word Bow-wow he at once turns to his picture book to find the picture of a dog.' Often in the second and third year when a child was busily engaged in one game the suggestion of another game would at once be acted on. Even if we restrict the application of the term suggestion to the accepting of an idea from another

¹ Op. cit., p. 139.

person without adequate evidence, then a great part of the child's life not only in the second but in the next few years is due to suggestion. It believes nearly everything the parent tells it.

The influence of suggestion on sleep. The phenomena 'to be discussed in this section probably do not come within the definition of suggestion we have adopted. They are included here because they have been described as examples of suggestion by Professor J. M. Baldwin: but Baldwin defined suggestion in a very broad way as 'the tendency of a sensory or an ideal state to be followed by a motor state'.¹ He experimented on suggestion and sleep with his little girl H from the first month till the child was 2;0. He thought that 'suggestion of sleep (gentle patting) began to tell upon her before the end of the first month'. The later stages of Baldwin's experiment are of great interest. He first took over from the nurse the task of putting H to sleep when H was 0;3. He closely imitated the nurse's actions, but with little success. This, he thinks, indicated that the personality of the nurse had a suggestive influence. Perhaps we ought rather to say that the new person of the father introduced a novel and therefore disturbing element in the general situation.

Gradually Baldwin acquired greater influence over H, so that during the second year, 'even when H was so restless that her nurse was unable to keep her from gaining her feet, and when she screamed if forced by her to lie down, the sight of myself was sufficient to make her quiet, and in five minutes, rarely more, she was sound asleep'.² The suggestion worked even when H was suffering from teething.

As regards sleep, some inanimate objects seemed to acquire a suggestive influence (in Baldwin's sense of the term) with some of my children. (If we object to extend the term suggestion to cover the reactions of the infant in which no other person is involved, then it is equally doubtful whether Baldwin's own observations can be labelled as phenomena of suggestion.) Indeed, by the age at which a baby was sitting up a good deal and crawling about, the mere laying of him down (if he was not hungry and if it was near his usual time for sleep) would often seem to produce sleepiness, though the infant had been very lively just before. Some objects, however, which become associated with sleep seemed to acquire a special power. Thus B at about 1;0, when laid in his cot to sleep, would grasp his eiderdown or blanket and drag the corner to his face; and Y at a later age would cuddle an old doll to her side and settle down comfortably. Perhaps we ought rather to say that the children would not lie contentedly without these objects,

¹ *Mental Development in the Child and the Race*, p. 101.

² *Op. cit.*, p. 111.

and once these were obtained they composed themselves to sleep; just as we might surmise that Miss Shinn's idea as to her niece at 11 weeks, of the establishment of an association between sleep and the mother's presence and her holding of the baby, might be interpreted as the mere producing of a feeling of comfort and security or an absence of unusual disturbing sensations.¹ But my impression was that these objects seemed to have some *positive* power, suggestive in Baldwin's sense of the term. One note runs: B, 1; 4½. 'M gave B his blanket this evening at 9.0 p.m. when he was quite lively, and he at once put his thumb in his mouth, as he does for sleep.' It may be said that we have here merely a process of association: the blanket suggests the idea of sleep which results in the assumption of an attitude suitable for it. Bechterev indeed maintains that 'suggestion must itself be subsumed under the scheme of association reflexes'.² But still there remains the question as to why an idea should so readily be transferred into action.

The common habit, at least of earlier generations, of rocking or singing babies to sleep (so far as it is effective at all, apart from the results of the comforting assurance of the mother's presence), no doubt produced its effect partly through absorbing the attention by a monotonous stimulus, and partly by its repeated association with sleep. As regards rocking, the question may be raised (as it is by Baldwin's argument) as to whether there must not be some original, more fundamental physiological connexion between the stimulus and sleep, before the more repeated effect can be set up by association. This seems probable, though it might be understandable psychologically without such a special physiological basis. For if at a time when the mere natural fatigue makes the child inclined to sleep, the singing or rocking takes place, an association is set up, and so in future the singing may produce the sleep-attitude. It is, of course, not uncommon for even adults to be made sleepy by some monotonous impressions even at a time when sleep is unusual; and one of my former students reports that each of his three children has frequently gone to sleep during a car journey, whatever the time of day.

We may conclude this discussion of suggestion and sleep by agreeing that all these phenomena are examples merely of association and habit—impressions giving rise to the idea of sleep and leaving us with the problem of how that produces sleep—not a problem of suggestion. There was, for example, a connexion between the

¹ See Miss Shinn, *Notes on the Development of a Child*, I, p. 265. Miss Shinn mentions later (p. 268) that only the mother could sing the usual lullaby.

² *General Principles of Reflexology*, p. 185 (London, 1933).

feel of the eiderdown and the ideas of sleep, though why it should induce sleep remains a mystery. A genuine example of suggestion of a type might be considered to arise, when one person attains such an influence over the child that sleep can be encouraged through that influence. Of course something more is meant by such an influence than the mere exercise of authority or even of persuasion which induces the child to lie down and close his eyes and try to go to sleep.

The 'cure' of pain by suggestion. Perhaps the most striking examples of what may fairly be termed suggestion before the age of 2, is the apparent banishing of pain by suggestion. 'Kissing a pain better' is of course a commonplace of motherhood. The popular belief, of course, does not prove anything, though it is unlikely that a custom should have continued so long and so universally if it had no value. Even if there is in such cases no real pain, the fact that often the child's weeping stops on being kissed shows that some change has taken place.

Several competent observers, however, have recorded their conviction that such suggestions may be really effective. Stern, for example, found it worked with all his three children; with one as early as 1;6 and with another at least till 3;5.¹ Miss Shinn found it effective at about 1;2.² Dearborn states that a burn on the mouth at 1;2, enough to cause a scar, ceased to trouble his child for more than half a minute when the kissing cure was applied. We must bear in mind the insensitivity of some young children, but it hardly seems likely that the pain of such a burn would disappear so quickly of itself. Dearborn adds, 'The slightest injury must now instantly be kissed by some one. This suggestion cure she applies also to her dolls.' Mrs. Moore also states that to have the hurt kissed was more efficacious than some medicinal remedy.³

The behaviour of my own children was similar. The kissing was frequently done during the second year and seemed really effective. Usually it would be the mother that kissed hurts better: but a note on B at 2;2 after a time when I had played a good deal with him says, 'B insists on my kissing his pain better instead of his mother doing it.'

This kissing better, however, was not merely an opportunity for mother comfort, as is shown by the fact that at 2;0 B was seen kissing his own fingers better on two different occasions, and as Miss Shinn's niece did in the earlier part of the second year.⁴ B did this at least as late as 4;9, when, if the part hurt was not

¹ *Psychology of Early Childhood*, p. 458.

² *Op. cit.*, p. 151.

³ *Op. cit.*, p. 81.

⁴ *Op. cit.*, p. 151. The context suggests that this was the period.

within reach for kissing, he kissed his hand and touched the hurt part!

Y at 3;9 still liked hurts to be kissed better and seemed comforted by it. With my boy C, even at 7;10, I tried the old cure. I met C whimpering over an injured knee and said, 'Come here and I'll kiss it better.' He did, and was quiet at once. 'Did that do it good?' 'Yes.' 'Are you sure?' 'Yes' (with all signs of sincerity in a boy who was extremely sincere). 'Why?' 'I don't know.'

Summing up this section of the kissing cure, we may conclude either that the pains cured are so slight that the mere directing of attention away from it or the banishing of fear and annoyance by petting is enough to stop the crying: or else that we have a genuine example of the banishing of pain analogous to what takes place under hypnotic influence. The evidence appears inconclusive: but while the former explanation is no doubt usually adequate and may be always partially true, my own impression was that at times the suggestion was a true banisher of pain.

Suggestion of the unpleasant or the fearsome. Suggestion that something was unpleasant, and appeals to disgust, were also particularly effective: so much so that they indicate latent repulsions only waiting to be called out, as we found also as regards fears. Thus

Y about 2;0. If we called things 'ki-ki' (i.e. dirty) she would avoid them, sometimes showing an expression of disgust on her face or repeating 'ki-ki'. B at 2;5½. My disgust at earwigs was at once taken up by B. He imitated my 'Ach' and would not go into the bicycle shed (where we had seen two) even to get a toy he wanted. No such disgust or fear was shown before my suggestion. B at 2;9. Not at all frightened of a dead mouse in a trap until the maid screamed: then he burst into howls.

This type of suggestion, either of disgust or fear, is no doubt largely the sympathetic induction of emotion, exemplified also with laughter and joy. That it depends upon a lurking innate tendency to disgust or fear is indicated by the fact that so often other kinds of suggestion would entirely fail: for example, with B our warning cries that he might hurt himself in climbing stairs, &c., were usually not of the slightest effect.

It is evident that the power of suggestion is likely to show most where there is strong innate impulse or specific wish waiting to be called out by appropriate stimulus. This has already been exemplified in the chapter on Fear.¹ Yet if the object is only

¹ Janet's view as to the work of suggestion in psycho-therapy comes near to saying that suggestion only 'fires off' an action to which a lurking tendency was already present (*Principles of Psycho-Therapy*, p. 138).

fearsome by suggestion, then the fear is also easily suggested away. Thus with

Y at 2 ; 4. When I acted as a 'bear' she retreated—put out her hands and protested with sounds of distress. But when some one said 'Nice Gee-gee,' Y's tone changed and she patted me on the head saying 'Nice Gee-gee.'

Similarly, if the fearsomeness or unpleasantness is only slight.

B at 2 ; 5 had his first cold bath. He whimpered and wanted to get out, saying, 'Not nice.' Next day, nearly cried in the bath, but when M laughed he changed his cries to laughter and said 'Tis nice', over and over again.

Suggestion and food. We seem to get beyond sympathetic induction of emotion when we find suggestion apparently affecting the attitude towards a taste of some unwelcome food or medicine. This seems more comparable with the banishing of pain. Dearborn wrote of L at 1 : 2½ : 'Suggestion acts powerfully even to the flavouring of food. The mere movement of pretending to add sugar to her porridge making it eagerly taken, when without it, it is not at all acceptable.'¹ One of my former students reports that she got her child of 3 ; 6 to take cod-liver oil by suggesting it was 'nice'.

This kind of thing happened often with my children. Sometimes, however, it seemed interpretable as a mere game. For example, when a child would take 'one mouthful for Daddy, one for Mummy, now one for pussy', &c. Nor do we know in such cases how strong the aversion to food really is, though we can note a rather violently asserted refusal to take it being subsequently overcome.

Supplementary motives may also assist, especially a desire to please the mother. A note on one of the boys at 2 ; 9 was as follows :

After his illness he took to-day one spoonful of egg, but refused more. An elder brother said 'I'll take it.' The younger then wanted it and took it. The same thing happened with his medicine.

This may seem like rivalry and competition. But in view of the other evidence of suggestibility in reference to food, it is also quite comprehensible that the elder's wish suggested that the egg was after all good. And this is supported by the fact reported by my wife that one of the girls at 2 ; 0 and 2 ; 1 'when reluctant to take food, is often influenced by being told that her brother likes it—without his being there to want it'.

There seem to be marked individual differences at this early age—either in suggestibility or as regards sensations of taste. For

¹ Op. cit., p. 146.

so careful an observer as Miss Shinn, with such an evident influence, too, on her niece, reports that she found it impossible to change her niece's opinion of a taste by suggestion.¹ Nor did suggestion often seem to increase or decrease the desire for food though examples are given of the special influence of the grandmother in encouraging eating.²

Limits of suggestibility. There are, clearly, limits to the extent to which this kind of suggestion can be applied, even at this early age. Severe pain, or the unpleasantness of medicine, may, of course, prove too great to be overcome by suggestion even of the parent, with his prestige backed by all the many occasions on which the parent's opinion and suggestion have proved dependable. Risks to that very prestige and to the confidence of the child are taken if one uses such suggestion beyond these limits. This is commented upon by one of my former students who made observations and reports for me on her own children. She writes :

I have found suggestion very helpful in dealing with the doctor and the dentist. A and W go regularly to the dentist and before each visit I announce that we are having a special treat to-day (this started about the age of 3). I am examined first and then a very understanding dentist invites A to have a ride in his exciting chair. There has never been any hesitation from either child because of the tools and apparatus. A has had no repairs and W only one small stopping. Similarly with the doctor's visits. I suggest that we are lucky to-day because Dr. B. is coming to see us. I have heard from several friends of their difficulties in getting their children to go to the dentist for examination or to visit the doctor—a child friend of three screaming loudly before going to the dentist for the first time and refusing to sit in the chair.

On the other hand, if this suggestion is persisted in and severe pain experienced in the dentist's chair, the power of suggestion will certainly be lessened thereafter.

The later power over a child through suggestion of a parent gives way to an influence which is partly at least and possibly largely a rational one. The child knowing that the parent's advice or suggestion in so many cases has proved to be right, and that what he has said proved to be true, may make quite fairly and rationally an inference that what he suggests or states will probably prove wise or true also. The abuse of this power of suggestion in the early stages will undermine the possibilities of this more rational influence.

Suggestion and aesthetic judgement. When Y was 2 ; 7 I performed a brief test to try the suggestive power of the mother. I used the pretty and ugly faces of Binet's tests (No. 5 for the four-year-olds) of which reproductions 1, 4 and 5 are supposedly

¹ Op. cit., Vol. I, p. 172.

² Op. cit., p. 229.

pretty, 2, 3 and 6 ugly.¹ Y first said correctly that No. 4 was pretty and No. 3 ugly. When an elder brother said No. 3 was pretty, Y first said immediately (as though by primary imitation), 'Three is pretty,' but then corrected herself and said more deliberately, 'No, that ugly; that (No. 4) is pretty.' Then her mother came into the room. I got Y again to say which was pretty and she repeated, correctly, that No. 3 was ugly and No. 4 was pretty. Then (following my earlier instructions) her mother contradicted her, saying, 'No, that (No. 3) is pretty, that (No. 4) is ugly.' Y agreed now that 3 was pretty, but then continued 'that was pretty' (No. 2) and 'that' (No. 6). These were the ugly ones and I suspected that perhaps she had now reversed her use of the words 'pretty' and 'ugly', the meaning of the words being at this stage no doubt very vague. Evidently she classed these ugly faces—Nos. 2 and 3 and 6 together. Then her mother changed and now said, 'That (No. 4) is pretty and that (No. 3) is ugly.' Y now repeated the same with much more alacrity than before, as though relieved by M's change, and suggesting that these changes were not due merely to uncertainty as to the meaning of the words 'pretty' and 'ugly'.

A week later when I showed Y the pretty photo of a little baby and she said it was pretty I entirely failed to get her to reverse her judgement by saying that I thought it was ugly. She repeated 'No, pretty', and she continued to do this when an elder brother joined and suggested it was ugly. I have little doubt that the mother's suggestive power was greater than mine with Y at this time.

Auto-suggestion. Something like auto-suggestion appeared with Y at 2; 5, when she was beginning to be somewhat nervous in the dark; someone said, 'Come upstairs in the dark,' and Y replied 'Oo, nice dark;' and again at 2; 5½, when she was shut out of the bathroom in a dark passage by a brother, she cried first, 'Someone's catching me,' and then as if to reassure herself, 'No one's catching me.'

Again, at 2; 7 I suggested that a toy dog was a lion coming to eat her up, and I trotted him up towards her. To my surprise she drew back and made defensive movements. Then when some one said, 'It's all right, Y, he's a nice lion,' Y at once changed to 'Nice lion—he wants to kiss Y.'

A number of similar notes on Y occur within the period of 2; 0 to 2; 6. When she wanted to remain sitting on her mother's knee, but S was told to take her upstairs to the attic to play, I expected protests, but she said, 'Y go to attics: nice attics.' It

¹ As given by Burt in *Mental and Scholastic Tests*, pp. 89 ff., and as numbered in my *Introduction to Experimental Psychology* (3rd ed., 1939), p. 258.

looked like an attempt to reconcile herself to the inevitable. X's typical reaction at this age would have been different. She would have gone, but only after saying, 'Well, I don't want to stop here any more.'

A note on Y at 4; 6 suggests that she was then vaguely aware of the possibility of auto-suggestion, or at least of the effect of repressing the experience of pain. 'M reports that she was putting iodine on her own finger and saying "Oo"; Y said, "It won't hurt if you don't say "Oo"'"—a juvenile extension of the James-Lange theory of emotion to the sphere of pain!

A similar note occurs on B at 4; 9.

Out of sorts and complaining of pains: but he said that he wanted to be poorly so that he would be given new toys. Later I asked him what made him ill. He said, "I was thinking about being poorly; that's what made me poorly I think, Daddy."

Of course one must bear in mind that the child would sometimes be told not to make a fuss about a little pain or discomfort or not to think about it. The above statements by Y and B seemed to convey convictions and not mere repetitions: but perchance this belief in the influence of suggestion was itself due to suggestion.

Contra-suggestibility. In spite of this general suggestibility of the infant in the second and third years occasional examples of contra-suggestion occur even at this early age. It is possible that we have some of the first of these examples in these notes which suggest the exercise of self-assertive impulses, sometimes evidently of a playful type: 'B, 1; 2½. He never gives kisses when asked—turns away. But he often offers them.' Also 'B rarely gives when one asks for a thing; but often offers something.'

Baldwin reports that his child, E, showed contra-suggestibility in her second year 'in a very marked way'. 'When told that a new taste was good—a suggestion readily taken in a positive sense by her sister at that age—she would turn away with a show of distaste even when she had liked the same taste earlier. When asked to give her hand into mine—a case of direct imitative suggestion—she thrust it behind her back.'¹ 'The tendency yielded to the all-conquering onset of imitation late in her second year, and she is now (third year) as docile an imitator as one could desire.'

But surely the two types of response may alternate even in the same period. Thus Y was very imitative at 2 years of age, as we have seen; yet contra-suggestibility was shown by Y at 2; 7. Thus 'Y plays at contradicting an elder S and asked M to say "yes" so that she could say "no".'

Again of B at 2; 8, a period when he was accepting some sug-

¹ Op. cit., p. 137.

gestions, it was noted, 'Contra-suggestibility rather marked just now. When I say, "Let Daddy do so and so," B says "No—Mummie," or sometimes vice versa.'

This kind of response sometimes seemed to be a kind of playing at self-assertion. For example, B at 4;2, 'Contra-suggestion still shown in statements. M, "You are going to be mother's good boy to-day." B, "No, I'm going to be mother's *bad* boy to-day." Yet at this period I noted: B, 4;1: B and I had been working in the garden. I went and left him alone. B said, 'What shall I do?', I, 'Anything you like.' B, 'I would rather do what you tell me.' Reason for this possibly that he may be afraid of doing something wrong in the garden (damaging plants, &c.), but more likely B thinks we shall think of something nicer than he could. Often, too, he wants me to find a story to read him. M says, 'I'll read whatever you like.' B, 'I'd rather have what you like.'

No doubt in general contra-suggestibility is likely to appear more frequently in connexion with self-assertiveness and obstinacy, though it must not be identified with them. And if so we may expect to find it happening more frequently in any particular 'obstinate period', such as Dr. Katharine Bridges found usually between 2;6 and 3;6—according to the individual child.¹

An experimental test of suggestibility or imitation. A simple experiment was done on my younger daughter at 2;7. I mention it, not because of any result of value, but because it is of so simple a kind that it may be easily used as a test of prestige—suggestion of the kind which might be classified under imitation. I put before the little girl and her mother two small boxes, one round and one square, in one of which I told them I had put two sweets. First I explained that her mother had to choose and then she herself, which they would have, and if they guessed right they got the sweets. First the mother chose a box and then the girl chose, then the box was opened and the sweets given to the one (or both) who had guessed right. Then the boxes were secretly prepared by me again. Then the mother chose again, followed by the girl, and so on.

In every one of her five guesses the little girl chose the same box her mother had first chosen; but her mother proved wrong in the third guess only. For comparison the same experiment was tried on her brother of 8 years and he followed his mother's choice in only four out of nine guesses. In fact, at the start he said, 'I'm going to choose the opposite each time.'

Then an experiment was done in which the young brother

¹ See 'A Study of Social Development in Early Infancy', p. 42 (*Child Development*, Vol. IV, No. 1, 1933). See also her book, *Social and Emotional Development of the Pre-School Child*, p. 86.

chose first and the little girl second. Again in every one of the six guesses the girl adopted her brother's choice, though he was wrong on the second and fifth occasions.

When a brother of 17 chose first and a sister of 13 second, the sister chose the same as her brother only 4 times out of 10, not following him even after the two occasions when he proved right.

A series of experiments of this kind might be used to show the relative influence of different persons on the imitative responses of the infant.

Rational grounds of the child's belief in adults. In concluding this chapter on Suggestion I should like to stress the fact that after the first two or three years we must allow for a genuinely rational basis for the acceptance by infants of ideas suggested by their elders, and here again there are rational and comprehensible grounds for the suggestibility of children to which the psychologist in studying children does not usually give adequate attention. Children accept, for example, quite readily the statements of their parents, believing fairy tales with readiness. One reason, of course, is that they have little on which to base any criticism of the ideas of another, and their tendency is to find such stories lively and pleasing, so that a mood is established in which the tendency to accept and believe is strong, for we are naturally more critical and suspicious when unhappy. But there is another good reason why children should be more suggestible. So many things have been told a child without evidence by father or mother, which he has later found to be true—all the many little facts of everyday life about which he receives instruction from mother and nurse; so that he quite reasonably comes to the conclusion that everything told him by grown-ups will be true. It is indeed a generalization not altogether foolish on his part, though, of course, he does not reason this out. Later, however, he becomes more critical. He finds some stories false. Wider experience checks his readiness to believe, but in the sphere which is not connected with this wider experience, for example, regarding political views and religious beliefs, his credulity may continue, that is, he is still liable to suggestion.

Similarly, actions can be more readily suggested to a child because of his impulsiveness—the tendency to act on the spur of the moment—and because of his lack of fixed habits.

CHAPTER XIV

Anger and Pugnacity

Anger, pugnacity, persistence, self-assertion and self-display. Each of these four tendencies and one emotion seems at times to be closely associated with some one of the others, and yet, at times, as our facts will show, pairs of them, sometimes said to be closely linked, seem to be quite dissociated. As a preliminary for our study of them, it may be useful to bear in mind two or three prominent points of view. James and McDougall treated anger as the emotional aspect of the instinct of pugnacity. Thorndike, on the other hand, insists that pugnacious behaviour and angry behaviour both need to be analysed; and he would divide the so-called fighting instincts into at least six, namely, escape from restraint, overcoming a moving obstacle, counter attack, irrational response to pain, combat in rivalry and several other minor types.¹ Again, some leading psychologists have contended that anger is apt to be roused when any strong conative impulse is thwarted more particularly by human opposition. While I never felt convinced of the intimate and invariable association of emotion with all those instinctive tendencies which McDougall has described, it must be said that this particular propensity, McDougall himself points out, pre-supposes others² and that anger itself, or rather the instinct-emotion, pugnacity—anger, after childhood ‘ceases to express itself in its crude natural manner, save when most intensely excited, and becomes rather a source of increased energy of action towards the end set by any other instinct; the energy of its impulse adds itself to and reinforces that of other impulses and so helps us to overcome our difficulties’.

One other preliminary point should be dealt with before we begin to examine the facts before us. In popular psychological and educational literature there is often a vague and very wide use of the term self-assertion, and anger is apt to be particularly associated with the impulse of self-assertion. All persistence and effort to excel are apt to be ascribed largely to the instinct of self-assertion; whereas there is a tendency (sometimes strong and sometimes weak) for any conative impulse to persist until its end is accomplished.

McDougall's exposition of the self-assertive impulse is no doubt first largely responsible for more importance being (rightly) attached to self-assertion. But some of his followers go too far and Adler's

¹ *Educational Psychology*, Vol. I, p. 68.

² *Social Psychology*, p. 60.

recent over-stressing of the importance of self-assertion has carried things much further. McDougall, moreover, interprets 'self-assertion' as a social instinct, meaning assertion of self over others, and not covering all persistent effort.

The fundamental nature of persistence. Thus in his *Outline of Psychology*, McDougall states that a mark of the behaviour of living things is the persistence of activity independent of the continuance of the impression which may have initiated it (p. 44), and again he refers to 'that fundamental persistency of all mental impulse, striving or conation. . . . We cannot hope to explain it; we can only accept it as one of the fundamental attributes of mental or purposive activity' (p. 281). Of course, such persistence is greater when backed by one of the great instinctive tendencies. But such are not necessary for persistence. Mental activities based on some specific interest such as music or another art may have an intense persistence.

The law seems to be analogous to the perseveration of ideas. Even the persistence in following out interrupted lines of thought is so strong that it seems to result sometimes in their completion in dreams, which may consequently seem to take the form not only of the fulfilment of wishes but very often in fact result in the following through of fears.¹

This persistence, then, is fundamental. It appears in animal behaviour; and as regards human infancy, evidence from the first months of a child's life is enough to show us persistence of effort long before the child can be thought to have any concept of self or any conscious effort to 'assert himself over others'. Indeed, in most of the activities of infancy, and many of adult life, no such social relationship or competition is involved. The persistence with which an infant of, say, 9 months will endeavour to remove a covering from his face, or one still younger to get his thumb to his mouth, are obvious examples.

While this early form of persistence then is quite independent of self-assertiveness it gives a basis for the development of anger if, as is generally agreed, anger is apt to be caused when a strong desire is thwarted; and the very fact of *persistence* in spite of difficulty is itself a sign of some strength in the tendency. And when anger is roused through the continued opposition of another person no doubt an element of self-assertion enters in when the child is sufficiently developed to realize something of the opposition of two selves.

The earliest signs of anger. According to some observers we have, however, signs of anger long before we can suppose that

¹ I have expounded this view of dreams more fully in *The New Psychology of the Unconscious* (Christopher, London, 1928).

there is any genuine impulse of self-assertion or idea of not being dominated by another. The first expressions which are interpreted by some as anger—violent crying, reddening, kicking, and so forth—are so general to any kind of distress that it is not surprising that different observers report the first occurrence of anger at very different dates. Sully thought anger was shown as early as the end of the 3rd week, but he does not give the signs.¹ Darwin, in referring to anger, mentions frowning at 10 weeks and says that when his child was 4 months old 'there could be no doubt from the manner in which blood gushed into his whole face and scalp, that he easily got into a violent passion'.² Dearborn, who suspected 'temper' for the first time at 8 weeks (because his child cried when her clothes were put on), refers to 'vexation' being shown at 0; 3 by the child almost sitting up.³ Major thought that the milder forms of displeasure, impatience, and vexation were succeeded by more pronounced signs of anger in the 5th month.⁴ That careful observer Miss Shinn, however, says that 'one of the earliest signs of anger ever detected' in her niece was at 0; 11—when she was being held for dressing.⁵ (I often noted that close holding of limbs was resented.) Stern also makes no reference, nor does Preyer, to anger in discussing emotions in the first year. Mrs. Moore refers to frowning as an expression of displeasure at 0; 8, but her first reference to fits of temper is at 1; 8;⁶ and Charlotte Bühler records anger only once under one year (at 0; 8) for her group of infants.⁷

As I have indicated, B and Y, on whom I have most early notes, were both very happy children; and our careful consideration of their happiness no doubt reduced the possible occasions of anger to a minimum. The cravings for the exercise of incipient powers, as, for example, in handling objects, biting them, banging spoons on their baby chairs to enjoy the making of noises, and so on, all these we tried to satisfy as fully as possible by providing always the kind of objects they needed, or putting the child down to try crawling, and so forth. With such abundant opportunity to satisfy the cravings of each period as it came, they were usually more ready for the necessary constraints required by health for food and dressing and rest.

There were, of course, occasions when there was frowning and banging of the hands at the bottle, when, for example, the mother

¹ *Studies in Childhood*, p. 408.

² *Mind*, Vol. II, p. 287.

³ *Op. cit.*, pp. 25, 41.

⁴ *Op. cit.*, p. 119.

⁵ *Notes, &c.*, I, p. 185.

⁶ *Op. cit.*, p. 39.

⁷ *The First Year of Life*, p. 41. Professor Bühler, however, does not state her criteria for anger. In the one example given, the infant (0; 9) 'with an angry cry hit the nurse'. Of course if actual hitting was required as a sign of anger that would greatly affect the numbers of the records.

tried to get them to finish a meal. And there was very often crying under the restraints necessary for being dressed, but of real anger I have no records in their first six months, though, as has been seen already in the chapter on Laughter, I noted such signs of joy as smiling and laughter at an earlier age than most observers. In a note on anger when Y was 1; 0 I remarked that she had for some months screamed loudly, frowned and got very red in the face when held, but 'even now (1; 0) it is very difficult to distinguish anger from intense distress'.

A definite note on B runs thus :

0; 11. Up to now I do not think there has been any real anger in B—any expressions which could not be attributed to disappointment and misery, though some signs may have meant impatience and anger, especially in 10th and 11th month, when there were sharp short cries.

My own records, then, support the views of the majority of observers quoted above, that genuine anger is not convincingly shown until towards the end of the first year.

Difficulty in discriminating between anger and distress. To some extent my own observations and reports of observers just mentioned confirm the opinion of Dr. K. M. Bridges, namely, that the occurrence of anger is difficult to differentiate in the early months.¹ It is only a special example of the general fact we have already recognized that at the earliest stages reactions are general and later tend to be more specific; and under reactions we here include expressions.

Professor Goodenough, in her own inquiry as to anger, had in her group of forty-five infants only two under one year of age.² The observations were made by parents who were told to record every manifestation of anger, rage or *marked irritation* shown by the child.

It must be born in mind that parents were on the look-out especially for this kind of response. Still more important, the term 'marked irritation' might cover many reactions not really anger. Including these reactions, the two youngest infants' records were as follows:—Boy observed from 0; 6½ to 0; 7½: number of outbursts = 22—average per hour observed, 0.07. Girl observed from 0; 9 to 1; 1: number of outbursts = 122—average per hour observed, 0.07.

To my mind, however, these suggested expressions are difficult to differentiate chiefly from those of strong feelings of distress. Dr. Bridges on the other hand finds anger difficult to distinguish from *fear*.

¹ Op. cit., p. 119.

² *Anger in Young Children*, p. 18.

Observations of the emotional behaviour of children point to the fact that while fear and anger may be distinguished theoretically, they so frequently occur together as part of a complex response to a complex situation that it is difficult to study them separately.¹

I agree as regards the first few months: but later—perhaps by 0;6—there are at least some expressions which suggest fear (for example, the incident with the cow, at 0;6, Chap. XI, p. 210) which can hardly be confused with anger: and there are some experiences of strong emotion which circumstances indicate can hardly be fear (as when a loved mother insists repeatedly on taking away a much-desired knife), but rather fit in with the causes we know produce anger later on. No doubt at times both fear and anger *alternate* in childhood more quickly than they can later: and possibly they may be blended. Thus

When 'playing at lions' with B at 2;7 I noted he hides his head on my knee. Once his attitude changed suddenly and he began hitting out at me and crying 'go away'.

A 2;7. When playing at lions, if he starts off on the offensive he is not afraid, but if he pretends fear for some time, then he is afraid and cries.

But here the alternations are clear and distinct.

It has quite truly been pointed out that some forms of expression even after the second or third year may occur with both fear and anger, for example, screaming. But the occurrence in a few cases of behaviour inconsistent with fear yet with expressions suggestive of either fear or anger, is positive evidence in favour of the two emotions being experienced separately at the age in question.²

More decided signs at about the age of one year. It was only towards the end of the first year that I became fairly sure that some expressive behaviour indicated anger. In B a note made at 0;11 refers to 'a stiffening of the back and bending himself right back, e.g. when not wanting to be dressed' and 'striking up and down with his arms' exactly as noted by Major in the 10th month.³ There were sometimes impatient cries when unable to get at some object he wanted.

Then come much more decided notes:

¹ Op. cit., p. 119.

² In an unpublished thesis by Miss Miriam Hill (Mrs. Highfield) entitled 'A Genetic Study of Temperament', observations on the betrayal of Fear and Anger by children between the ages of 2;0 and 7;0 were recorded. Among 600 children aged between 2;0 and 3;6 there was practically no correlation between Fear and Anger scores: neither was there among 60 children, ages 3;0 to 5;0, at a residential school. Among 60 Nursery school children ages 3;6 to 5;0 there was a negative correlation of 0.46.

³ Op. cit., p. 120.

B, 1; 0 $\frac{1}{4}$. Temper developed last two or three weeks. Screams violently, sometimes simply for being held for a moment to be dressed or if he can't reach a thing, but especially for holding.

As to Y, there were sometimes also before the end of the first year very loud screams, which we could not attribute to pain; also frowning and getting very red in the face—signs of a moderate degree of anger. There was now also a curious horizontal wagging of the hands.

Y, 1; 0 $\frac{1}{4}$. Often noted she waves her arms, with hand wagging when annoyed—wanting to rid herself of something, e.g. bottle when she has finished and M tries to get her to take more.

As to this hand wagging, compare Yerkes' chimpanzee who shook his hand vigorously—completely relaxing it at the wrist, when assuming in play a fighting pose.¹ A little later we note in Y what seem genuine temper tantrums.

Y, 1; 0 $\frac{1}{2}$. When forcibly held she stiffens violently, contracts muscles (bending backwards), screams and bangs hands about. Also anger screams at M's leaving her. Y, 1; 1 $\frac{3}{4}$. Thwarted desire (when brush was offered instead of a bottle) caused waving of arms and wagging of hands; she threw the brush away and wagged her hands.

Extreme anger because of thwarted desire was shown unmistakably, I think by

B at 1; 4. Hurt himself badly with ruler (on mouth) and then later when I would not give it him again showed marked signs of anger. Screamed loudly, waved hand and arms in air, and then dropped on ground and bowed his head to ground and then rolled over on back still crying. He kept crying and rolling over thus several times. Very strong passion this morning. He wanted to play with a little girl's horse and refused to leave it when it was time to go in. Made himself rigid and screamed, rolled about on the ground in front of house.

The first appearance of pugnacity. At 1; 4 we find the first clear suggestion of pugnacity.

B, 1; 4. Smacks us now if cross—something more than merely pushing our hands out of the way. 1; 4 $\frac{1}{2}$. B cried at being taken out of his bath—and struck at his mother several times. 1; 9. When M and I kissed repeatedly he came and hit hard at me several times.

Yet *temper may be still independent of pugnacity* directed against others. Thus

B, 1; 8 $\frac{1}{2}$. Shows temper by throwing himself on ground and waving arms to and fro like a swimming breast stroke.

¹ See *Chimpanzee Intelligence*, p. 31.

My former student, Mrs. A. L. Harrison, also reported to me that her boy at 2; 10 'would often roll on his back and kick, when angry'—again anger without pugnacity, in the sense of an attack on another, though the kicking may be regarded as one element of a more mature tendency.

Once when B was 1; 10 he wanted his engine but was not given it at once. He fell into a temper and bit his own hand in excitement. Here is a curious appearance of blind aggressive action, biting, but not directed against another.

On the other hand, Mrs. Moore noted of her boy at 1; 8, 'In fits of temper . . . he struggled and bit': and K. M. Bridges noted biting the offending person by some of her nursery school children when in 'temper tantrums'.

B, 2; 3. Got into a rage with M because she would watch him at his toilet. He screamed and hit out at her with his hands. Threats of a smack and even a slight smacking had no effect; but 'If you're not a good boy I shan't take you to play with John' quietened him almost at once.

Happily there were few occasions of anger, and B and Y (and indeed the others) on the whole were happy and good tempered. The next entry on B is not till

2; 10. M and I arguing in fun. I called her a 'silly baby'. B jumped up and began to hit me, saying 'Mustn't say that.' (M had shown not the slightest annoyance.)

The quick changeableness of emotion in the infant, already referred to, was also shown with respect to anger by B and Y. This, of course, is not always true of anger in young children; a sullen mood or sulks may remain, but the records and the memory of myself and my wife all agree in this: that whatever faults they had, sulkiness was not that of B or Y. B's remarkable resilience indeed and his Mark Tapley cheerfulness under difficulties made it difficult to apply mild penalties successfully when needed, and this remained true through boyhood. At the age of about 4; 0, after he had been put in the corner for some misdemeanour, he said to me in a quite friendly tone when he was allowed out: 'Daddy, do you know what I do when you put me in the corner?' 'No,' I replied. 'Well,' he said, 'I tell God funny stories!'

Anger and pugnacity. The close association of anger and pugnacity is well recognized, and it is evident in some of the foregoing notes on B from 1½ to 2 years. But it does not appear before 1; 4. As we have seen above, anger without aggression towards another appeared in B as late as 1; 8½ and in B. H. at 2; 10. As late as 1; 8½ there is a note that suggests pugnacity, including physical attack, without anger. 'I had to smack him—not enough

to make him cry. He looked at me sullenly and then, deliberately and after quite a long pause, he struck at me.'

There is no record of Y hitting others at so early an age, though I carefully watched for it. I wrote of Y:

Y, 2; 0 shows anger without combat or pugnacity: she will violently stamp her feet and scream with no attempt to get her toy back from S. 2; 0½. Violent kicking of feet and screaming when Mrs. P. carried her out: but no hitting.

Then some very slightly aggressive actions appear.

Y, 2; 0¾. Something was taken from her by M. She screamed and stamped (a very characteristic sign at this age), then afterwards slapped paper on M's chair two or three times. 2; 1. Very angry, screaming and kicking legs when maid J took her out of room. Took off J's cap and threw it on the ground. But J says she never strikes.

From 2; 1 to 2; 4 there were frequent occasions on which she stamped and cried with anger, but no signs of hitting were seen, except that at

2; 4, when Y collided with a coat in the hall and hurt her eye, she hit it and said, 'Naughty coat.' When M would not do what Y wanted, Y tapped at M's head but stopped her hand as soon as it touched M's hair. (Very similar performance noted at 2; 8.) 2; 5. Screamed when J took her out of the room, but only gave a gentle pat on J's shoulder.

These were the only signs of hitting seen, though I was specially looking out for signs of pugnacity. A note at 2; 4 says, 'Still only kicks when angry' (meaning the kicking about of the legs). 2; 7½, 'Still no hitting, kicking or scratching seen.'

The first record of any hitting another person by Y is at

2; 8. When a brother a few years older was teasing her by mewing like a cat, Y said 'Don't' angrily, and then again, and finally hit at him. But later when it was repeated she ignored it. Then she ran to the other side of the room and said 'Say it again'! (*Mutabile femina!*)

2; 9. There was a more serious incident. Y threw a fork at the maid J and it hit her face. Y said to me calmly later when I asked her what she did: 'I did bleed her.'

This was from a child who a few years later was so tender-hearted that she could not bear the thought of the smallest creature suffering.

On one rare occasion I saw her hit at her mother (at 3; 0½) but with no screaming or sign of violent temper

Y, 3; 11. I saw her hit an older brother without any sign of real anger; annoyance perhaps would describe the feeling, and she told him that he was naughty.

It was also noted of X at 3 ; 6, 'Dances and stamps with rage if her will is crossed'; but there was no note of angry hitting. My own observations suggest that signs of anger appear some time before there can be any fully developed pugnacious impulse: and that throughout this period of early infancy one may have anger without any well-defined pugnacity, and certainly without anything that could be called fighting.

There were hints too that there might be pugnacity without anger, as shown above. Another possible example was this: B at 2 ; 8 smacked me when I was pretending to cry, although he was himself crying sympathetically: and the same thing happened when he was 4 ; 3.

Playing at anger and pugnacity. In some instances there was something like playing with the pugnacious impulse—just as there was playing with fear. Certainly Y at 2 ; 3 played at being angry, shaking her curls and puffing out her lips and cheeks.

B at 2 ; 8½, in playing with me sometimes gets so excited as to appear vicious—very like a dog. He will then (if he hurts me) be sorry and kiss the part hurt.

Fighting for fun and bullying and teasing are, of course, familiar things in the playground. They may be sadistic in that there is a deliberate attempt to cause pain—the impulse being apparently quite free from anger. But apart from this my own observations lead me to agree with Katherine Bridges, who on the basis of observation of infants (from 2 ; 0 to 5 ; 0) in the nursery school concluded that 'hitting or pinching for fun, through sheer self-assertion and love of power may be distinguished from hitting in anger'.¹ The distinction is that in the latter case there is hitting because of interference, whereas the child is not first annoyed when he hits for fun.

The clearest examples of this I have seen recently was in a Nursery School. I had got on friendly terms with the children by chasing them about and thereafter several of the boys, aged 3 and 4, would keep coming up to me, hitting out, and then scurrying away. One youngster of 3 ; 0, assuming a threatening attitude, cried to two others slightly younger, 'Hold him for me, boys,' and aimed a blow at me and raced away. Sometimes a boy, evidently in completely good temper, would run up to another and punch him in the ribs.

Similar things were noted in nursery school children by M. Etziony.² Thus 'Boy J (4 ; 1) and Boy D (4 ; 0) began a fight with B (3 ; 3) for no reason, and then J and D ran to me for shelter.

¹ Op. cit., p. 55.

² A method of studying the character traits of the pre-school child, *Jour. Genetic Psych.*, 1933, Vol. 42, p. 196.

They assume a true expression of fear, although they are not at all afraid of B.' Here there is play at fear as well as fighting. Again, a

boy of 3 ; 3 'clenches his teeth and shakes his head violently and furiously for no apparent reason'—a play at the expression of anger: also a boy of 2 ; 6 plays at anger when playing with a doll. 'He spansks her angrily and has a clouded face and clenched teeth.'

Now in such a case we cannot suppose that there is any desire to cause pain to a doll. This case, and others similar, fit in well with the view that any emotion may be played with; as we saw in the chapter on play:—as any other new capacity or experience may be played with and repeated for its own sake.

This being so, it is possible that many of the supposed sadistic impulses in children are in reality only play of this kind: as in the example of B given above and in Etziony's observation with his child which he labels 'Sadism', 'Boy of 4 ; 1 runs for no apparent reason to three children at hand and hits them: he pinches one of them, clenching his teeth.'

Very occasionally something that appeared to be slightly different was noted in B, though never in Y. Thus at

2 ; 10, B sometimes cruel to the kitten. We cannot teach him not to tease it, although he likes it and loves to feed it.

Whether such actions are really a way of enjoying a feeling of power, or an example of an innate and irrational impulse to cause pain—an impulse of biological use in increasing ferocity in fighting, or whether there are sadistic impulses in the Freudian sense even in childhood, or whether all apparently sadistic impulses in childhood are really playing at pugnacity, the existence of both playful fighting and even serious fighting seems certain, and pugnacity without anger is also at least suggested.

Of course I have been discussing this question of sadistic impulses in references to an age at which it may be reasonably thought that the child knows that it is causing pain. Some of the supposed cruelties of the second year are undoubtedly due to the child's ignorance of what it is doing. There was, for example, a sign of an entirely friendly attitude in the following:

B at 1 ; 4. Very pleased with kitten. Stroked it and later tried to stamp on its foot. N.B. He had trodden on its tail by accident before and the kitten squeaked. This apparently pleased B and then he tried to tread on it again.

Other apparent cruelties even later than this, such as pulling flies to pieces, may arise from the same motives, whatever they may be, as the pulling to pieces of flowers or toys.

There seem, indeed, no general or biological grounds on which anger should necessarily accompany pugnacity. No doubt the emotion serves as an inhibitor of fear and as a source of added energy when this is needed in attack, when the pugnacious tendency—or perhaps the hunting instinct—is at work. But why should it be enlisted in *all* fighting if the fighting is securing its end in a satisfactory way? For the greatest cause of anger is supposed to be the thwarting of a strong impulse.

This is, I think, indicated by experience of and observation of many examples of pugnacity in all the forms it takes in human beings; in the primitive fighting of fists, and in the fighting of wits.

The question may seem of no great importance. But the clear differentiation of innate impulses and emotions may prove to be of great importance in detecting abnormalities in early development and of accounting for apparent abnormalities in adulthood as regressions to infantile behaviour.

Variations of anger with age. When Y was 3; 5 I noted 'M says that Y hardly ever shows anger now.' My last note of any aggressiveness even of a mild kind towards M is at 3; 8, when she smacked at her mother when her will was opposed. Such pugnacity was reported towards an elder sibling, however, and no doubt continued in our absence at times. My last note of anger in B was the above at 2; 10, except for a note at 4; 8 about his 'sulking', which is noted as 'very unusual with him'. Some occasions may have been missed, of course, but notes on other 'feelings and emotions' continued up to five years.

K. M. Bridges found that outbursts of temper in her Nursery School children were more frequent in the period 2; 0 to 3½ than from 3½ to 5; 0.¹ F. L. Goodenough in her group of forty-five infants found that the frequency of outbursts was greatest about 1; 6 for both boys and girls: but the numbers for this age group were only five boys and four girls, and as the reports were made by parents, the standards might vary greatly, carefully coached and instructed as they were.²

In accordance with the general principle of the increasing specificity of impulses with age, Goodenough admirably sums up the changes with age thus: 'As age advances, the proportion of outbursts in which the behaviour consists only or chiefly of simple displays of undirected energy decreases, while the frequency of retaliative-behaviour increases. The percentage of observable after-reactions, particularly resentfulness and sulkiness, increases steadily with advancing age.'³

¹ Op. cit., p. 133.

² *Anger in Young Children*, Chap. II (Univ. of Minnesota Press, 1931).

³ Op. cit., p. 245.

Apart from any growing co-ordination of the organism which might lessen futile outbursts of temper, I think that the development of reason in the child may have some effect. He comes to see that violent tempers lead to no good, and may bring further punishment, and so he nurses his grievance, and hence sulkiness increases, while tantrums decrease. Two findings of practical interest may be quoted from Professor Goodenough's report: first, that 'giving the child his own way is reported much more frequently for children who have many outbursts than for those who have few'.¹ Second, that, with one exception every case where 'inconsistency of discipline' appeared to be a major factor occurred in the group of children whose outbursts were unusually frequent, while unusual consistency of discipline almost always occurred in the group where outbursts were rare.

My own general impressions and a number of my notes bear out these conclusions, but only provided that one refers them to general outbursts of crying and milder forms of temper and even pretended temper, rather than strong innate anger responses. The latter would involve the assumption that even in the first two or three years genuine anger was largely under control by infants. I have no notes of such a thing, but it may be possible.

We have already mentioned as evidence of B's control of his crying at about 1;0 his stopping his violent cries when his hand was burnt and saying 'Ta'; and this would seem to be as hard a task as inhibiting anger.

Of the influence of irregular discipline we had clear evidence. For example, at one period, when B was staying at his grandparents' home, his grandmother insisted on someone going to him if he cried even a little after being finally fed and bedded for the night. B very quickly got used to this, and by the time we got home was quite spoiled out of his former good habits. For two nights afterwards he yelled violently when he found no one came to him, but thereafter quickly returned to his former habits. Without being able to quote exact notes I am confident that, in a number of ways, regularity of treatment resulted in the fixing of habits without much protest: whereas when there was vacillation there was trouble. Furthermore, with B and the others, but especially with one of the others, there was a distinction in this respect between their attitude towards the father and mother. The latter being more tender-hearted, would often give way again after a child had several times acquiesced in some requirement, with the result that there would be renewed weeping and protests and appeals to the mother when she was in charge, but much quieter acquiescence when the father was at hand. Typical notes are

¹ *Op. cit.*, p. 248.

B, 1; 1. Cries a good deal to M. Was quite good when left alone with me after M left the room. 1; 2. Practically never cries to me. Says 'Ta, ta' and then gives up quietly if he does not get what he wants.

A similar note was made on C at 2; 0. With at least one child this difference continued as late as 8 years of age.

I am not now expressing an opinion as to the invariable wisdom of one or other of these two lines of treatment, but simply stating facts as to the development of habits of emotional responses. On the practical question I believe that the ideal is complete regularity of treatment. But this would involve a very complete knowledge of the child's condition and of his capacity. I have known occasions when I felt that a child of, say, 1; 6 or 2; 0 after indignant and prolonged crying had got himself into such a state that it was unfair and foolish to expect him to quieten down alone or without pacification by being granted his wish: and I remember clearly coming to the conclusion with B before he was 2; 0 that a concession after considerable delay, was not always taken advantage of the next time. The child may have realized that he might get his way by crying hard and long enough, but remembering the long struggle would not think it worth while; or if he is at an age for which that is too intellectual a way of putting things, there would be some imagining of the crying, probably of the most unpleasant period of the struggle, and the feeling of aversion to that might inhibit the beginning of the crying.

Sex differences in anger and pugnacity. There was a notable difference in the expression of anger between my two little girls and at least two of the boys. Acts of aggression in this early period—about 2; 0 to 2; 6—were never noted in the girls, though they could scream and stamp most effectively. Such a difference in only four or five children is, of course, only of value in rousing a question in one's mind. Following this clue I found that Darwin writes that when his son was 2; 3

he became a great adept at throwing books or sticks, etc., at anyone who offended him; and so it was with one of my other sons. On the other hand I could never see a trace of such aptitude in my two daughters.¹

Sully records that his boy would not only hit but bite, and says that his own observations suggest that 'a small boy has more of the savage attack than a small girl'.² Mrs. Moore noted 'struggling and biting' by her boy at 1; 8 while Dearborn's notes on his little girl as to anger record only bouncing up and down and throwing herself backwards at 0; 11, and at 1; 2, crying. M. Etziony noted, in the twelve boys he watched, eight examples of pugnacity, either real or play, against only one among the twelve girls.

¹ *Mind*, II, p. 288.

² *Studies of Childhood*, p. 233.

Goodenough found angry outbursts after 2 ; 0 more frequent and more violent among boys than girls, though individual differences were greater than the sex differences. Her comparisons are, however, weakened by the fact that these observations were made by many different parents. But she does state that kicking (which was chiefly reported for the age 1 ; 0 to 2 ; 0) was indulged in much more frequently by the boys than the girls, though it was not necessarily kicking persons. Stamping, on the other hand, was more frequent among girls than boys, especially over the age 3 ; 0. Pulling away or struggling was reported 36 times of boys, only 4 times for girls : while pouting or frowning was reported only 6 times for boys and 29 times for girls : throwing objects was 22 times reported of boys, 6 times of girls.¹

Dr. K. M. Bridges also found that as regards anger more creditable scores were made by girls than boys, who showed 'more aggressive pugnacity', the girls sulking longer.²

Summing up these various items of evidence, it would seem that there is probably a genuine sex-difference appearing at the age of 2 ; 0 and even earlier, in respect to anger and aggressiveness, boys being somewhat more prone to anger, but especially more prone to pugnacious or aggressive actions. This difference must surely be innate. One cannot imagine, say, any supposed suggestion by parents of appropriate behaviour for girls as contrasted with boys being so effective at the age of 1 ; 0 or 1 ; 6.

¹ *Anger in Young Children*, pp. 59-62.

² *Op. cit.*, p. 227.

CHAPTER XV

Self-assertion, Submission, Display and Shyness

Early signs of assertiveness and persistence. We have seen that anger and pugnacity may be exhibited in the second year, and about the same period the child's feeling that he is opposed by another may rouse the impulse of self-assertion. As we have seen, anger may exist independently of pugnacity or self-assertion. Similarly, of course, self-assertion may exist without anger or pugnacity.

Y, 2 ; 0 $\frac{3}{4}$. S sat in chair Y had been playing in. Y said, 'My chair.' S. 'No. My chair.' So repeated. Then Y turned to little table S had hold of : 'My table.' S. 'No, *my* table.' (teasing her)—struggle. Y ran to M and appealed to her : no response—then Y went right away from S to toy cupboard and holding door, said, 'My door!' Y, 2 ; 3. Screaming when M washed her hair and forcibly laid her down in bath to rinse it. Just afterwards Y boasted that *she* herself had 'washed Y's curls', and that she 'lay down in bath', adding 'Good girl, Y!'

At much earlier ages than that, however, Y, like the others, would often show *persistence* in the attempt to do something when we were trying to stop her. But a keen desire to do the thing and to do it herself would be enough to explain this. Mere opposition to another person does not necessarily imply a wish to assert oneself against them. We may hate doing it and yet do it because it is necessary for an end we are determined to achieve.

When and under what circumstances there first crept into the child's opposition to others some faint impulse to overcome the others for the mere sake of victory and the first thrill of power over another, it is impossible to say. There may have been an element of it in the attitude shown by B at 1 ; 2 $\frac{1}{2}$, when he 'teased M by offering her a crust and then withdrawing it'. In the following cases I think there was probably no felt opposition to others :

2 : 4. Y went to put tray of toys into a cupboard. I went to help : she shouted 'No'—bobbing up and down and so hurting her head. As she went to have it 'kissed better' by M I put toys away : but she went back to the cupboard—took out tray of toys, saying 'Kickie' (dirty, untidy) and put it back herself. 2 ; 4. Just now there is a great development of determination to do things 'myself'—e.g. dress herself. Wanted to go walk in park 'myself'!—the beginnings of full realization of independent self.

Possibly some would call this latter the beginnings of pride—a delight in contemplating the self and its powers, an incipient

sentiment for self. But there is first, I think, something more elementary and less self-conscious.

It is more self-conscious in the next stage. Thus :

Y, 2 ; 11. Self-assertion shows itself just now chiefly by boasting, e.g. calling attention to the fact that she did something 'all by myself'.

Here there seems to be clearly a conscious pride in performance implying a certain consciousness of self, the beginnings of a self-sentiment, yet without any triumphing over others. There was indeed no competition.

Assertiveness and opposition to others. Reports of the appearance of assertiveness and opposition to others appear especially after about 2 ; 0. Sully writes of the sudden emergence of self-will in his boy at 2 ; 2.¹ Indeed, there is evidence that a period of revolt about the ages 2 ; 0 to 4 ; 0 is normal and its absence a ground for suspecting some weakness of character later.²

In all the biographical studies of infants hitherto referred to there are very few references before the age of 2 ; 0 to behaviour which seems clearly prompted by an impulse to oppose others for the sake of opposition ; or any suggestion of genuine conscious assertion of the self. The earliest of the few is the following by Scupin on his boy of 1 ; 1½, quoted by Stern and described by him as 'wilfulness'.³

The first item looks like playing at self-assertion, but the second is more serious.

The boy feels an irresistible impulse to act in defiance of our commands. For instance if he wants to put something forbidden into his mouth, he first looks round shyly at us. If we then forbid him : 'No, no !' he repeats with roguish laugh : 'No, no !' hesitates a moment—and with sudden resolve puts the thing in his mouth in spite of us. To-day his father slapped his hand every time he tried to put the comb in his mouth ; the slaps grew harder and harder and the child more and more furious and wilful ; sometimes, certainly, he was a little over-awed by his father's stern look and hesitated with the comb half-way to his mouth, but defiance gained the victory, until at last we took the comb away from him.

The first item at least is suggestive of self-assertion without any pugnacity—if, indeed, it is possible at this age. But the second shows how easily such assertiveness if resisted leads to struggle and anger.

So in the case of my own children it was at times clear that the

¹ *Studies of Childhood*, p. 451.

² C. W. Valentine, *The Difficult Child and the Problem of Discipline*, p. 7 (Methuen, London, 1940).

³ *Psychology of Early Childhood*, p. 477.

thwarting of a child's wish to have his own way *because it was his* and not merely a strong wish for a particular thing, was sometimes a cause of specially intense anger. Thus, my wife made the following note on

B, 2 ; 8. On Sunday he flew into a dreadful passion on 'having his will crossed' and became almost hysterical. When he had done what he was told he persisted in saying that he had not, and tried to make me say so too. Threw himself on the floor with rage when I would not say it. We had to soothe him in the end. Again to-day he got into the same condition over a trifle (he did not want to go out). Smacking had no effect. Shows no ill will to us on such occasions. Clings to us and begs for his own way while almost hysterical.

The same thing was especially true of X at about 3 ; 0 and later. A note by my wife on X runs :

X, 3 ; 6. X is very self-willed just now. Longs to assert herself. Dances and stamps with rage if her will is crossed. One day I locked her in my dressing-room till she should stop. She was silent a moment so I unlocked the door and said she could come out. She would not, however, held the door and said she 'did not want to come out'—a final resort to save self respect when resistance was futile.

This characteristic I also noted several times later in X. Thus when told she must not have a sweet, as a punishment, and later this was remitted, X refused, saying she did not want one.

B, 3 ; 4. When told not to do something he sometimes obeys and pretends he does not want to do it !

Y, 4 ; 8. When I put Y in corner and later said she could come out, she said she did not want to. This is the first time I have noticed this kind of self-assertion in Y.

I have described this peculiar form of assertiveness or pride to several large classes of my graduate students. In the first class, nearly all the forty women students and half the men students (about the same number) had seen precisely similar attitudes in infants in their own families or those of friends. In two other classes (in all 200 students) nearly all the women and the great majority of the men stated that they remembered adopting such an attitude themselves. (If there is a sex difference here it may be that this substitute for firm resistance does not occur in some of the more aggressive males.)

With B and with X this assertiveness was combined with an intense affection for the person against whom the rebellion was usually directed, namely, the mother. Indeed, it seemed rather an insistence on their own way for its own sake and not for the sake of triumphing over another, and sometimes it seemed largely a craving for independence. X was well summed up in a note by my wife at

2;4½. X is very self-willed and very obstinate at times, but can be brought round much quicker by being told she is not my 'little hen' than by being punished. She is very independent, loves to feed herself and tries to dress herself.

Anger, as we have agreed, can be roused by the thwarting of any strong impulse or desire, and more particularly when the thwarting is done by another person. But this is also precisely the situation likely to arouse self-assertion, and there would seem no reason why self-assertion itself should not be one of the impulses the thwarting of which may rouse anger. Hence we have a double source of anger when self-assertion, aroused by the thwarting of an impulse, is itself thwarted.

The difficulty of discriminating exactly the various types of behaviour which include as one element either anger, self-assertion, persistence, pride or self-display, is in truth due to the fact that we have almost imperceptible gradations between these as between other psychological phenomena. A mildly interesting action is accompanied by mild persistence. A stronger impulse meeting with some impersonal difficulty results in stronger persistence and perhaps mild annoyance. At the right age even an impersonal aim may be pursued with some of the backing of the impulse of self-assertion, the first enjoyment of personal power, and this when it becomes more self-conscious may itself be accompanied by display and boasting, the pride in a child's own performance. Then if the thwarting be due to the interference of a person, the self-assertive impulse may come especially to the front and appear as the main element in the whole process with anger lurking close at hand, if self-assertion is thwarted unduly.

Playing at self-assertion by children from 2 to 5. Playing at assertiveness was seen in Y at 2;7 when, after contradicting something M said, Y begged her to go on saying it so that she, Y, could go on saying 'No'!

Observations made by my daughter on nursery school children in their play and school organization illustrate the enjoyment of playing at self-assertion and also some other points we have been considering. A supreme desire among most of the children in her school was to be chosen as 'Mother' for the midday meal. This was shown by the children, especially the older ones in this age group, begging daily to be the 'mother'. The duties of the mother (who was adorned with an apron) were to take plates of food and spoons to the children at table, and to clear the plates away afterwards.

On the other hand, it is well known (and I have seen it especially when watching children at play in a public recreation ground when not supervised) that a certain 'bossiness' may appear in older

children when, for example, playing teacher and school. I recently saw a child of some twelve years occasionally smack a younger one in her class and use a very scolding voice. It was all play, but the enjoyment of power was here predominant.

The functions of the 'mother' in the Nursery School were entirely beneficent—there was no element of pugnacity or cruelty. We may feel sure, however, there would be a feeling of importance as well as of helpfulness and a consciousness of being prominent and noticed.

The distinction between various types and degrees of self-assertion may be illustrated by notes given by Etziony under the general heading Self-assertion.¹

No. 49. J. S. (boy), 3; 11. Approaches me with a girl E, 2; 6. J. S. is boasting, 'I am bigger than E! I am a big boy, ain't I?' E looks down submissively.

Here there is mere boasting. There is nothing aggressive or antagonistic. There is, however, an element of display.

No. 46. Some children of an older group on seeing the younger children coming down exclaim mockingly, 'Here the babies come!'

Here there is perhaps a faint element of aggression, but the chief thing suggested is a consciousness of and expression of superiority due to greater age.

The felt superiority of the male appears early. Thus

No. 53. Self-assertion. Girl A (3; 3) 'spansks' boy, 4; 3. G to A with warning pride: 'Don't hit me, bad girl—I am a boy!'

A neat example of the combination of the two aspects (a) self-assertion and display of power over an inanimate object and (b) boasting of this power to a person, is given by

No. 56. Self-assertion through destruction. Boy, D, 4; 0, throws down the blocks of his castle and turns to me with pride in his accomplishment: 'See! Knocking them down.'

Self-display distinguishable from self-assertion. In his *Social Psychology* McDougall contends for the existence of what he calls the instinct of 'self-assertion (or self-display)'. The exposition there stresses the display-aspect rather than the assertion-aspect, while in his later *Outline of Psychology* assertiveness is stressed under this heading, while display is connected primarily with the mating instinct. In his later book, *The Energies of Man*, a single innate propensity is described—'to assert oneself over, or display oneself before, one's fellows'.²

¹ Op. cit., pp. 194, 195.

² See *Social Psychology* (9th ed.), p. 62; *Outline of Psychology*, 1923, pp. 158 and 159; *Energies of Man*, p. 98 (London, 1932).

We have already seen how sometimes the behaviour of a child of about 2;0 or 3;0 seems to involve both domineering over others and showing off or boasting. But my own observations led me to conclude that these two terms—self-assertion and self-display—cover impulses which are not identical.

In the first place, some element of self-assertion seems at times to enter into the insistence on and persistence in the child's own pursuit of an end, without a hint of self-display. The more explicit self-conscious self-assertion of which I have given examples also occurred without anything which could properly be called self-display. On the other hand, the earliest examples of self-display were quite different from those of self-assertion and they occurred considerably later. I wrote of B at 1;4½: Noticed 'showing off' for the first time, making 'pussy noises' and 'baa-ing' to a stranger, looking at her and laughing. This was an isolated note, however, and indeed may have been only the making of friendly advances. Dearborn's first note on self-display was also at 1;5: also an isolated note and again interpretable as friendly advances.¹

The next reference to self-display in B was at 2;3. A note shows that he refused one day to walk like a policeman (one of his comic little tricks) for Mrs. D., 'though he generally likes displaying himself.'

Of Y, too, development of self-display was shown only about 2;3. I noted at 2;0 that she hardly showed it. Then she began to say 'Daddy, look,' at things she did, and would show off her new pretty frocks to me and others.

Of X, on the other hand, who was, as we have seen, extremely self-assertive, I wrote: 'X never marked herself off by much display.' Later still, Y was noted at 2;5 as very fond of self-display, but not assertive. Y's assertiveness, when it occurred, was usually of a different type. Thus

Y, 3;5. No extreme signs of self-assertion noted: only she loves to do things for herself and to help with work in the home.

In self-display, indeed, the whole behaviour and tone seem different from typical self-assertion. A typical example was the daughter of Dr. C. at about 2;0. When I first saw her there was considerable self-display for my benefit—doing somersaults, &c., smiling at me when I looked, but with distinct coyness. The whole procedure was quite different from anything which could be called assertiveness.

It was also true of C as late as 8;6 that he was remarkably free from self-assertion and most docile, and yet 'very apt to display'—showing how he can jump, what flowers he has grown,

¹ Op. cit., p. 165.

&c. It is interesting, indeed, to speculate whether self-display and domineering self-assertion may not even be to some extent alternatives, the one being adopted which the individual is best able to exploit successfully, with due reference to the persons concerned at the moment.

Assertiveness weak in some children. In some children neither tendency—assertiveness or display—seems to be strong. C's display of boasting, for example, was of a very mild type and assertiveness in the sense of self-will or domination of others was almost entirely absent. My daughter also reports that one at least of the boys of 4; 0 or over in the nursery school she is attached to, is of a most submissive type. In 6 months she has never seen him attempting to boss others or be aggressive. One of the individual studies given by Miss K. M. Bridges is also of the non-assertive type; for example, C, age 3; 2, who was affectionate and popular, and played without bossing or teasing.¹ Indeed, if we agree with McDougall that there is in man an independent innate propensity towards self-submission, then merely in accordance with probability the various combinations of different degrees of self-assertion and self-submission would produce some individuals in whom self-assertion is very weak and self-submission very strong. Older children who seem to belong to this type are familiar enough in the school class-room, but submission to a teacher in authority is not the same thing, and is consistent with strong assertiveness among one's fellows.

We may admit, however, that in the great majority of young children the impulse of self-assertion in some form is active: but this is not to admit that it is necessarily the supreme and only impulse. Apart from the co-existence of a delight in self-submission it is checked by affection, as we shall see more fully later on. We cannot therefore agree to Adler's assertion concerning 'every child' that 'to dominate those about him becomes his chief purpose in life'.²

Self-submission. It is difficult to discuss whether a genuine innate propensity towards self-submission appears in infancy because of the complication of the first possible appearances of the impulse with the natural helplessness of the infant. In this first year the child is so completely under the control of the parent, his activities so entirely limited by the environment in which he is placed, that he is bound to submit, with, of course, occasional protests. From these earliest weeks habits already begin to grow, so that the child becomes in many ways 'conditioned', as behaviourists would call

¹ *Social and Emotional Development of the Pre-School Child*, p. 250.

² *Understanding Human Nature*, p. 34. On p. 33 this paragraph begins by referring to 'every child'.

it, and, like a well-trained horse, eventually comes to a stage when he does many things which he might not do if he knew his own power of resistance. By that time, however, affection has begun to appear, and then we are faced with the question as to how far this brings pleasure into the mere act of obedience. This, of course, is not identical with the self-submissive impulse; but the self-submissive behaviour of the infant may at times be almost indistinguishable from that due to affection, as it may be at other times from that due to mild fear. Affection, indeed, seems to make self-submission more enjoyable. If we are to regard submissiveness as a genuine innate impulse we must expect at some stage something beyond a disciplined obedience, with perhaps a mild fear of punishment. We require to note spontaneity and satisfaction in the very act of submission. From a biological point of view such an instinctive tendency may not be absolutely necessary to survival, when the infant is so completely under the control of the parent. We can indeed hardly expect it to appear when self-assertiveness is appearing, because still the weakness of the child means that beneficial control by the parent is not supremely difficult. On the whole, in spite of frequent obstinacy shown especially by A and B, obedience in these earlier years was so ready even when discipline was not threatened, that we may reasonably conclude that at least early in the second year the self-submissive tendency was ripening. It is clearly difficult, however, to discuss this impulse apart from the growth of affection which will be treated in the next chapter. I may say here, however, that on many occasions a spontaneous and apparently happy obedience was shown by all my children at the early age of one and two years which strongly suggested the workings of a genuine impulse towards self-submission, distinct from mere learning, by experience, the superior power of the adult.

On the other hand, the hypothesis that such an innate tendency exists may not be quite essential to explain the facts. Affection and a desire to please might conceivably be adequate to account for the conduct. Certainly, taking the period as a whole, anything in the nature of penalties was very rarely needed. A scolding tone was usually, though not invariably, enough at about $1\frac{1}{2}$ to 3 or 4 years to bring obedience and submission; so was a suggestion from the mother that the child was 'mother's little boy', &c. As we have seen, such appeals were sometimes adequate even to lead the child to control a violent fit of anger.

More definite evidence, however, of an independent and an innate propensity towards self-submission does come at a later stage when there was sometimes an actual request for orders, 'You tell me what to do,' and so forth. Another kind of evidence which may bear on this question is exemplified by the following note:

B, 2 ; 0. When I said ' I shall smack you ' he held out his hand ready. A week later : To-day I said he was naughty and he solemnly said ' Daddy smack ' and held himself ready. When I did so gently he said cheerfully ' (Th)at's it now ! '

At 2 ; 2½ I noted that B responded with extraordinary readiness to the suggestion that he should give up sucking his thumb when he went to sleep. He was told that big boys didn't do it. This might well have taken place as the result of the desire to please us, the desire to be grown up, and so forth, but a note somewhat later does suggest a positive wish to be obedient and submit. Thus at 2 ; 4 my wife noted :

B asked me if he may suck his thumb if he wakes up in the night. Would not do so without my permission but goes on begging for it.

The clearest example of submissiveness in B, however, was his attitude towards a boy friend nearly one year older than himself. Thus :

B, 1 ; 9. Often goes to play with John (age 2 ; 8). We noticed how subdued B was with J, doing everything J tells him, and not even objecting much when knocked down. B seems to be too interested in watching J to care about his own way.

Shyness. The study of shyness seems to follow naturally our last topics. If not the opposite of self-display it is decidedly opposed to it, and McDougall gives us as a type of self-abasement, a description of a child's behaviour which seems identical with shyness.¹ If this were so it would be still easier to support the argument I have just put forward about the limitation of the self-assertive impulse : for there is plenty of evidence of shyness in children. But though shyness seems closely allied to self-abasement it does not seem to be identical. In shyness there need be nothing of the tendency to ' follow, obey and accept as a leader ', McDougall's latest description of the submissive tendency.² Shyness also in its early manifestations does not lead to suggestibility, while submissiveness does. McDougall, however, does not really identify shyness with self-abasement. For in his discussion of sentiments in his *Social Psychology*, he gives a similar illustration of a boy hiding behind his mother's skirts in the presence of a stranger with the addition now and then of a sudden performance of somersaulting—a piece of self-display. McDougall calls this *bashfulness* and regards it as due to a conflict between the two impulses of self-assertion and submission and their corresponding emotions of elation and subjection.

We may preface our evidence by a reference to the careful

¹ In his *Social Psychology*, p. 65.

² *Energies of Man*, p. 152.

study of shyness by J. M. Baldwin, which I think is largely true so far as it goes; except that it divides the stages of development too sharply and omits the earliest stage entirely.

Baldwin styles the first type of shyness in the first year 'primary organic bashfulness', and says it takes on the positive signs of fear, with protestation, shrinking, crying, &c. In the second year Baldwin finds the development of a toleration or even liking for strangers, especially if the child has met a good number. Finally, he says, in the third year there is a return of bashfulness with no fear, but an intense consciousness of self.¹

My own records indicate first a period in which there are no signs of shyness or fear. Of course, as we have seen in earlier chapters, the infant in the first few months shows some preference for being in the mother's or nurse's arms; there is no doubt already some vague feeling of satisfaction by associations with food and comfort. But the turning from a stranger does not occur at first: indeed, it must obviously require as a necessary condition a capacity to recognize the mother and others constantly with him, at least to the extent of experiencing some feeling of familiarity when seeing or hearing them; and there was no proof of that in any of my children by 0; 2½. Thus there was no hint of shyness when A at 0; 2½ was held by a visitor; he "talked" to her freely; similarly B at 0; 2¾ was 'talking' and laughing to Mrs. B., quite happy in a strange woman's arms.

Distinguishing strangers from parents. Signs of recognition of his mother and myself now begin to appear in B. I suspected, for example, a smile of recognition at 0; 3; and a week later I noted (but without thinking then of any connexion between the phenomena)

B, 0; 3¾. Much more solemn now when visitors present—does not smile and talk, but stares earnestly.

Sully also observed no fear of strangers before the 4th month, when he thought the boy C began first to discriminate between familiar and strange faces.²

At this stage in B and Y was noted that sudden jerking round and sway of the head, after a responsive smile, which we surmised, however (in Chap. VII, p. 96), might be due to the unsteady effect of emotion. At 0; 4 something more like coyness was noted. Thus

¹ See *Mental Development in the Child and the Race*, p. 140 (New York, 1906).

² *Studies in Childhood*, p. 410. I have discussed the evidence for the early recognition of parents more fully in Chapter XVI, p. 310.

B, 0; 4, while held in Mrs. B.'s arms looked at me, smiled at once, turned his head right away, then back to me, smiled, turned coyly away again, and so on.

Also of A, B, X and Y, notes like the following were made about 0; 4: 'Often turns coyly (smilingly) away when I look at him. The beginning of shyness.' I may add that in the opinion of Professor Stout also, who saw this behaviour in one of the boys at the time, this seemed to be the beginning of shyness. Similar behaviour was shown towards the mother at

0; 5. B 'coy' with M to-day, turning head from her when near. I had just failed to distract his attention from her by interposing my face and making faces at him. He looked over or round me for M.

Like other phenomena, shyness of a fearsome type is a particularly variable thing in its early stages and dependent on the exact conditions of the moment, especially the presence of the mother or father. Thus

B, 0; 4½. Very jolly at Professor R.'s house, smiling at strangers. Here he was with his mother. B, 0; 5½. Taken by Mrs. M. (whom he knew) into her house: brought back crying. Was this because of so many strangers or of the place? If so, this is the first time.

0; 6. More signs of consciousness of novelty of new faces. 0; 7. No sign of shyness with three visitors to our house, who made friendly advances; gazed eagerly at them for more play. 0; 8. M reports B smiles at every one in the street and sometimes calls out to them 'aa'.

Thus long before the end of the first year B began to be friendly and at ease with strangers, at least when he was with his mother or father. The same was true of X and Y. Here A showed a difference. Thus

A, 0; 7. Cries sometimes when strangers speak to him; even when he is on M's knee: this specially so with women wearing veils.

With the others there was also a definite limit to the degree of familiarity tolerated. Thus

X, 0; 9½. Shows no shyness when out in pram; laughs and talks to every one: but cried when a stranger (in a hat) took her on her knee.

The addition in my note of the words 'in a hat' recalls that we suspected that hats, especially big black hats, were disturbing to several of the children about this age.

Distinction between shyness and fear. It is evident that these early examples show a great resemblance to fear reactions, and it is sometimes very hard to discriminate between the two. But I think we must here go further than Baldwin, for some of the reactions are clearly different from fear. Thus

B, 0; 8. Coyness noted twice to-day, the first time for some months. When Granny V. was looking at him and smiling, he turned suddenly and buried his face on M's shoulder, though he had known Granny V. several days and been greatly petted by her. There was similar behaviour later towards me when I was trying to coax him from M. B half turned to me and then buried his face on his mother's bosom several times, and then finally came to me.

The same thing was noted several times with C during the corresponding week.

In typical cases of shyness there is also an absence of crying or trembling; there is extreme quietness; hiding behind the mother is a characteristic reaction. Though there may be some element of fear, as late as this, of a stranger even when he is making friendly advances, the shy responses to mother or father and other loved relations indicate the maturing of a distinctive response well before the end of the first year, and often with strangers there is a characteristic quiet smile, inconsistent with the emotion of fear. Dearborn also wrote of his child at 1; 1, 'Bashfulness is now more prominent every day.' Darwin noticed shyness in his child of 2; 3 towards himself after an absence of a week.¹

A note on B at 1; 0 states that he sometimes shows a great liking for strangers. Yet the attitude varies with the individual. Thus

B, 1; 3½. Very shy of Mr. W., buried his head in M's skirts—and later ran to her several times after approaching him: but shook hands while M held him and later was quite happy in his arms. B, 1; 5¼. Afraid of the big but very friendly blacksmith at first. Yet at a restaurant a few days later made friends with strangers and let a waitress take him away from his mother into a dark office; and on a visit to friends at 1; 7½ made friends with children at once.

Thus in B and Y and X, at least, the friendly attitude began well before the end of the 1st year: and yet shyness appeared at times in the 2nd year, no doubt depending partly on the attitude of approach adopted by the stranger. Apart from a reference to mild shyness at 2; 2 and a disinclination to 'recite' to visitors at 2; 5 there is no relevant note on B till one at 2; 11½ showing a strong conflict between shyness and a desire to gain a reward for singing. 'He began to sing and then ran to my knee, hid his face saying, "No I can't."' Of Y at 2; 3 and 2; 5 there are notes of typical childish shyness—for a short time—disappearing more quickly when a stranger did not pay too much attention to her at first. At 2; 9 there was shyness of a boy (2; 3) younger than herself. She was quiet but not unfriendly and could hardly have felt fear of the little boy.

¹ *The Expression of the Emotions*, p. 351.

Shyness as a separate innate tendency. In these children, then, we have evidence of a genuinely *innate* tendency not identical with fear, though some of the early reactions described may be merely mild fear, which could not be due to experience seeing that never did B or X or Y suffer anything at the hands of strangers. In these later stages the distinction from fear becomes clearer. The fact that it was roused by a request to *recite*, though it did not arise from the mere presence of strangers, shows its resemblance to what in adult life we know as self-consciousness.

At this stage, too, shyness may come into conflict with self-display—a conflict noted in B at 2; 3½, and in

Y at 3; 1½. When Mr. M appeared after six months' absence, Y was very quiet at first: but when he talked about her growing to be a big girl she began to boast to him—'I can skip.'

Dr. C.'s little girl of 2 seemed to reveal both shyness and display. There were coy glances while she was displaying her gymnastic abilities before me, a stranger, and yet she kept away from me when I invited her to approach. These later reactions seem to fit McDougall's view as to bashfulness being due to a conflict between self-display and self-submission; though if, as maintained above, there is a distinguishable response 'shyness', we could regard the conflict as being between self-display and shyness.

In some children self-display develops more than shyness and so comes to predominate, helped perhaps by friendliness. There was a change in Y about 3; 3—3; 5.

Less shy. At M's party of seven strange women (only one known to Y) she went readily and sat on their knees. She speaks to and smiles at strangers in shops and in the street.

The number of persons present was no doubt a factor. Thus

Y, 3; 8. Rather overawed by being brought into large party of fifteen people—but even here after a time she talked to individuals.

On the other hand, in C shyness did not decrease and it remained characteristic of him at least up to adolescence. Up to that period C would blush, while at the same time laughing, even if one of us looked steadily at him! Here there was absolutely no shyness until C felt that he was being specially attended to. A little girl visitor R about 5 years of age, showed no shyness at all unless directly addressed; but even when asked what she would have to eat she at once clapped her hands over her face. But in neither of these cases was there any sign of self-display or of conflict between it and shyness or self-submission, and certainly no fear.

In conclusion, my own impressions of these occurrences of

shyness from the earliest months suggest an independent innate tendency not identical with self-submission or merely due to conflict in the way that McDougall suggests; nor does it seem to me that Thorndike's definition of shyness is quite satisfactory, namely, that shyness is 'submissive behaviour minus the gross bodily cringing and the inner acceptance of subserviency'.¹

Some of the first appearances of shyness are, it seems, akin to expression of mild fear: and perhaps should be classified as such. One might indeed be tempted to classify all the first-year occurrences as fear, were it not for the fact that some of them later occur with near relatives already familiar and certainly not feared, if not yet loved.

Possibly these first genuine experiences of shyness are due to the first experience of affection, which we shall discuss in the next chapter. The tendency to shyness in many when under the first strong feelings of love for a member of the opposite sex is well known. We may even imagine some biological significance here if we assume that the female is made more attractive by coyness; at least by the appearance of self-submission she may in more primitive conditions have shown there would not be vigorous resistance to the approaches of the male. And in more modern times a girl by shyness (and especially by blushing) may encourage a diffident youth in the belief that there is some hope for him. But why is the male also so often afflicted? Perhaps it is an example of the frequent transmissions to one sex of qualities primarily useful in the other.

In any case, as pointed out in the introductory chapter and as we have seen more closely in the study of laughter, some responses and expressions seem but loosely connected with any special impulses, and serve biological ends in only a clumsy way. Thus one type of response or expression may become complicated with several different impulses; blushing, for example, may be an accompaniment of profound shame, or of most trivial self-consciousness as when C blushed when I or his mother or sister looked at him steadily.

There may even be such self-consciousness about blushing that there develops a fear of it so decided as to be given a special name by psychiatrists—Erythrophobia.²

¹ *Educational Psychology*, Vol. I, p. 95.

² L. Kanner, *Child Psychiatry*, p. 229.

CHAPTER XVI

Sympathy and Affection

Primitive passive sympathy. This is the expression proposed by McDougall in his *Outline of Psychology* instead of 'Sympathetic induction of emotions', which he used in the earlier *Social Psychology*. McDougall means by the term the tendency of one member of a species to feel a similar emotion, whether sorrow or joy or fear, to that which it sees or hears expressed by another member. It is a useful concept with which to start our study of sympathy in the infant. It should be clearly distinguished from active sympathy, in which there is an impulse to help.

The first event which might be brought under this heading is the smile or laugh in response to a smile or laugh. As we saw in the chapter on Imitation, this occurred in Y as early as 0; 2 $\frac{3}{4}$ and in B at 0; 3. For this to be genuine sympathy in the above sense, we must assume that either the parent's laugh produces a feeling in the child, which in its turn gives rise to a laugh, or that the child when it laughs experiences a feeling to some extent resembling that felt by the parent, a point to which we have referred in the chapter on Laughter. Here I can only say that these early smiles and laughs look like expressions of friendly or happy feelings such as the parent feels in his own greeting of the child.

There is, however, less doubt when one considers the sympathetic response to signs of pain or distress. At a very early age one finds crying in response to crying. It is doubtful whether it happens in the first few weeks. M. J. Blanton made special observations and experiments with gramophone records on this point, and was unable to get positive evidence of sympathetic crying in the few infants she tested under fifteen days.¹

Charlotte Bühler asserts that a child of 2 months cries lustily if he hears another child who is crying.² At this early age, however, any loud noise alone may be at times a sufficient cause of crying. Furthermore, crying does not always produce sympathetic crying. For example, Miss Shinn noted that her niece, age 0; 3, laughed on hearing a little child cry, and again at 0; 6.³ Also Charlotte Bühler herself found that at 0; 2, only 10% of the babies tested responded by sympathetic crying if the crying baby was not seen, 32% if it was seen. (See our earlier chapter on 'Earliest Expressions and Causes of Feelings or Emotions'.)

¹ *Psych. Rev.*, Vol. 24, 1917, p. 481.

² *The First Year of Life*, p. 35.

³ *Notes, &c.*, Vol. I, p. 114.

Nevertheless, even if we cannot be certain of a sympathetic response in these early weeks, sympathetic crying does appear at an age when the child has ceased to cry at other noises unless they are very sudden or strange. My own earliest note on apparently sympathetic crying is as follows: X, 0; 3½. Uttered a loud scream when I imitated the crying of a baby. This, however, may have been a cry due merely to a loud and unfamiliar noise, and so with the crying of Darwin's baby at 0; 6 in response to crying. As we saw in the chapter on Fear, strange noises such as the playing of a band, or my mewling like a cat, caused B to cry at the age of at least 0; 6. Such an explanation, however, becomes very unlikely a few months later when such sounds are likely to be familiar; and Baldwin's child at 0; 5 cried at the sight of a picture of a man weeping—when there was no noise.¹ The interpretation, then, of sympathetic crying as an innate response seems more credible.

Katharine Bridges, after observing infants of various ages under 1 year as well as over, in a Foundling Ward, came to the conclusion that apparent responsive or imitative crying between the ages of 0; 4 and 0; 7 was really due to the arrival of the nurse with bottles with which the cry of another child became associated. Her observations were that imitative crying only appeared at 0; 9 and 0; 10.²

My own observations convinced me that such sympathetic crying does occur at least towards the end of the first year and after. Thus:

B, 0; 10, gave a short cry when M cried with pain when hot water fell on her foot.

A, 1; 3½. A cries when he hears S crying. Loud yells if S is screaming. B, 1; 4. Sympathetic whine and solemn expression when he heard a child cry. M noticed this several times.

Y, 1; 2½. S was hurt when playing with her: M sympathized and he cried again loudly: now Y gazing at him, cried very loud too. Y, 1; 4½. Obvious signs of distress, anxiety and alarm when S screamed on being tickled.

I carefully watched Professor T.'s baby of 1; 0 when another baby of 0; 4 repeatedly cried. Master T., a very placid, good-tempered baby, seemed quite indifferent for some time; but later a few short cries were uttered twice but without any look of distress. It was just as though they were mechanical imitations.

Kellogg's baby at 1; 1 would frequently cry at the crying of the baby ape with which he was brought up, from 0; 10 to 1; 7, 'especially if he could see the ape as she cried'.³

¹ Op. cit., p. 316.

² See article on 'A Study of Social Development in Early Infancy': in *Child Development*, Vol. IV, 1933.

³ *The Ape and the Child*, by W. N. and L. A. Kellogg, p. 150 (New York, 1933).

Much no doubt will depend on the condition of the responding baby. Professor T.'s baby was being entertained by some admiring visitors and could not see the crying baby. When an infant is occupied one would expect it to respond less readily; while if it is hungry a cry of another may help to set off a cry which is in fact an expressive cry.

Some of my notes show a different response to pretended crying. Thus :

B, 0; 6. Laughed when I imitated his crying.

Y, 1; 0½. No sign of sympathy when M imitated crying (very well, I thought), putting her head on my shoulder. Instead Y looked wonderingly a little at first: and then laughed: and so two or three times.

B, 1; 4. M says he always laughs when she pretends to cry.

These notes suggest that the pretences are seen through, but at 1; 4, even when M was really hurt by his banging her lip, B laughed.

Perhaps we have here a misinterpretation by B, or the beginnings of laughter at a slight mishap of another, a certain example of which occurred in B at 1; 5 (see the Chapter on Laughter, p. 242). Dearborn noted that his daughter L at 1; 3½ burst out laughing at a portrait of herself crying; and he adds, 'a similar effect is always produced in her by a picture of a tearful child. Though at other times L cried in response to crying, for example at 1; 11.'¹

In respect to sympathy as with everything else, we must expect large individual variations. In addition, sympathetic reaction, being in its nascent period, may be like so many other propensities and abilities, very unstable and very intermittent in its early occurrences.

It is obvious that there is no biological need for the development of genuine active sympathy—the attempt to relieve or comfort—until the child is several years older and really able to help: and granting that this tendency first to have the same feeling of distress is a preliminary stage, at one year it is well ahead of its time and, consequently, we should expect it to be still in an unstable condition.

We may add that the tendency some adults show to shed tears when a first-class actress weeps is a further testimony to the persistence of this innate tendency.

Is primitive passive sympathy innate? There is, I think, little doubt that primitive sympathy exemplified by sympathetic crying is an innate tendency. McDougall's arguments are weighty, not only in reference to sympathy with pain, but also as to sympathetic induction of fear and anger. The occurrence of such induction in very young animals, before their experience could explain the distress

¹ Op. cit., pp. 159 and 182.

or fear, is also worth recalling. But the following order of events in the infant's experience may be suggested by the Associationists.

(1) Infant A cries.

(2) The cry rouses in infant B by association the unpleasant feeling or sensations he has himself 'cried at'.

(3) The unpleasantness of this revived feeling causes B to cry.

Baldwin¹ seems to think this process does occur, as well as a *direct* stimulation of emotion by the perception of its expression; and Charlotte Bühler at least suggests that the heard cry produces in the child displeasure connected with his own crying sounds.²

We have already pointed out that the first associations can take place by the end of the first month, and soon after that a child might quite conceivably establish an association between cry—noise and displeasure. But such can hardly be the explanation of smiling in response to smiling, as the *seen* smile will not have been associated with the child's own feelings expressed by his smile, and if this can occur with a smile it suggests at least that the same could occur with a cry.

Again, although as we saw, the imitation of sounds may begin by about the end of the first month, we can hardly regard sympathetic crying as merely an example of imitation of a heard sound. It seems far too expressive of genuine strong feeling.

We shall shortly see reason to believe that there are innate *active* sympathetic impulses; and on general genetic grounds that is unlikely unless there are innate tendencies to *feel* something of the distress. From the point of view of desirable social development it would seem to be unimportant whether sympathetic crying is genuinely and merely innate, or depends entirely on associations, or whether it is partly innate, and partly strengthened by association. Of more concern is the existence of innate active sympathetic impulses, which we shall discuss shortly.

There are also a few observations that suggest a sympathetic distress without any sound of crying as a stimulus; for example, Dearborn's child at 1;4 invariably cried when told about Little Tommy Green putting pussy in the well.³ B at 3;6 cried sympathetically when my lip was bleeding—I made no sign of pain—though M showed some distress. Preyer's child cried at 2;3 on seeing paper men cut into pieces.⁴ But the Associationist may still argue that even in such a case there is, first, an idea of pain suggested; second, a similar pain imagined or roused in memory; and so, thirdly, this pain expressed by crying. Though this interpretation cannot perhaps be disproved, it seems very improbable on the more general grounds mentioned before.

¹ Op. cit., p. 317.

³ Op. cit., p. 163.

² *First Year of Life*, p. 35.

⁴ Op. cit., p. 150.

Furthermore, it cannot explain sympathy with some animals in distress, in that there is no cry resembling that of the infant, and such sympathy may occur very early. Thus

Y, 3 ; 8. M heard Y crying in garden—screaming as though, M thought, she had been stung by a wasp. M ran to her and found it was because Snowball, the dog, was biting a young thrush, which was crying aloud. Next-day I asked her why she cried, and she said she did not like to hear little birds crying. (Nearer to the truth, perhaps, than one might expect.)

Active sympathy, or the protective impulse. As yet we have no clear evidence that these sympathetic cryings are accompanied by any impulse to relieve suffering. At this early stage, indeed, so far from being invariably an impulse to help, there may be at times actual *aversion from signs of distress* and even aggression towards the sufferer. Thus

B, 1 ; 9½, upset by M crying in the nursery at bad news from home, shouted 'Daddy' repeatedly when I was comforting M. He came up and pulling a wry face, struck at M several times. Yet before I came in M had said, 'Come and kiss Mummy', and he did. B at 2 ; 1 would not go near S when S was whining on nurse's knee. (A note two days before reports there was no jealousy shown by B. When S was quiet he wanted to kiss the baby.)

Y, 2 ; 1. When M took her to bed I pretended to cry: She said 'I kiss Daddy.' She left M to come to me, but did not come right up to me while I was whimpering, but did when I stopped and uncovered my face. And so again.

This curious *resentment of crying in another* mingled with, or alternating with, sympathetic crying is very suggestive. It would seem to be the basis of an aversion-reaction to the suffering of others not infrequent in adults. Some people turn away at the sight of suffering even if they could help at some self-sacrifice: and among some gregarious animals a suffering member of the group may be viciously attacked by the others: I have several times seen this among fowls.

These examples I have given of apparent resentment by infants of the sight of suffering are, however, the only ones observed during the second year. That they cannot be taken as prophetic of a lack of sympathy with pain, will appear later when we shall meet instances of keen sympathy in both B and Y. Notes during this second year already include some in which active desire to help reveals itself. Even in the example given above, when B hit M, he had first shouted for me to come, I think, to help: and at 1 ; 8, B kissed my head when he had pulled my hair and made me scream.

As soon as speech develops sufficiently the evidence for action

accompanying sympathy becomes still clearer, for it may be expressed in words.

B, 2; 3. I was playing with him: then he left me to 'go see Mammie'. I pretended to cry because he was going, making sobbing (not loud) noises and covering my face with hands. He ran back and saying 'Daddy no ki' sought to pull my hands away and patted me on the head. As I persisted he began to cry bitterly; and so later when I began again. Have never known such distress at any one crying. (N.B.—He was tired.)

In these two examples we have the first sign of active pity—of some action to relieve suffering. About the same period Y showed pity and attempted to comfort and relieve. Thus

Y at 2; 4 fell downstairs; M just caught her by foot. M very upset, sat on stairs gasping, with Y on her knees. Y kept saying, 'Sorry, Mummy, don't kie, put stuff (ointment) on Mummy.' 2; 9 $\frac{1}{2}$. S gave M a big squeeze and she gave a slight scream. Y ran to her, 'Oh, my poor mummie'; evident distress in her voice. Then 'Did S hurt you?'

Y, 2; 11. C showed Y his injured nail—nearly off. She said in a distressed tone, 'Oo, poor boy—poor nail!' At the next showing she seemed very interested in it—almost amused. C showed no distress when he said 'Look', and she said, 'Poor skin—can I kiss it?'

3; 3 $\frac{1}{2}$. Y hit me accidentally on the eye—and she kissed it better. About ten minutes later Y came into room and spontaneously asked (several times till M called my attention to it), 'Is your eye better, Daddy?'

Y, 3; 5. M reports Y very sympathetic, e.g. if M says she has a headache, Y will put her cold hands on M's head (as I have asked her to do on mine sometimes). Similar examples are given by Stern of active sympathy shown by his child at 3; 0 and 4; 7.¹

It is clear that there may appear, at least by the end of the second year, pity, implying not only sympathetic distress felt for another, but also an impulse to comfort and relieve that distress. That means there is developing already what McDougall calls the parental or, better, the protective impulse. (McDougall uses the term 'active sympathy' for something quite different.) About this age both B and Y showed very keen sympathy even with suffering which they could not see. Thus

B, 2; 6. Was heard crying in nursery. Nurse went up and asked why: he said he wanted to give some toys to the little boy who had none (M had told him of one). Later he *insisted* on giving me four toys for the boy and showed no distress when I took them away. Y, 3; 6. M told her that Joyce whom she had seen that morning had no mother. Y said in very sad tones, 'Oh, *poor* Joyce; got no darling mummy.'

B, 3; 11. Several nights ago when it was very stormy I heard him

¹ Op. cit., p. 522.

crying after being put to bed. I went to him and asked him what was the matter. He sobbed and said he was thinking of the poor sailors at sea.

The cynic may suggest that the crying was a subterfuge to get company in the storm. But this was the fearless B, and I have no doubt myself that it was real sympathy, and other notes fit in with such imaginative sympathy. Thus

B, 4; 11. I described a soldier wounded in the knee so that his knee was in a pulp. B shuddered and almost cried and said. 'Oh! That gives me a pain in my knee.'

Possibly B was unusually sympathetic at this age; but it was not so keen later in life as to cause him excessive distress: and Y was at least as sympathetic, and so I think were two of the others when they actually saw suffering.

In this sympathy with unseen pain, and even with trouble never experienced, the little child is already passing beyond the sympathy or pity even of the higher animals. Kellogg's little ape was roused to sympathy and even active pity or protection by carrying the crying child.¹ But Köhler emphasizes the fact that for his apes to show pity even for their fellows, the sufferer had to be seen; and they comforted another shut away from them in a cage only when he howled.² Unfortunately some adults seem in this respect to remain at the ape level.

Active sympathy with an unfamiliar type of distress seems to have been shown by the nursery school girl of 4; 0, the youngest of a very poor family of fifteen, who was seen by my daughter tenderly covering up a worm which had been exposed in the school garden! This section may be concluded with a note made by my daughter about a boy of 4; 0 in the same nursery school.

Bobby, age 2; 0, cried a good deal when new to the school. His brother Willie (4; 0) cried with him at first sympathetically; then recovered and comforted his brother in a fatherly way, saying, 'It's all right, Bob, Willie here.'

The interesting thing here is the late occurrence of sympathetic crying—combined with the active sympathy. Dr. Katharine Bridges scores a mark *against* a child of nursery school age for sympathetic crying in her scale of emotional development, that is for children between 2 and 5 years of age. From the broader point of view of social development a child even of 3-4 who cries sympathetically with another and then helps him, would seem to be higher in the scale than one who does neither. Possibly as regards emotional stability a child should normally cease to cry sympathetically before

¹ Op. cit., p. 151.

² *The Mentality of Apes*, pp. 283 and 286 (London, 1925).

the end of this age range, but surely many adult women do it. I have a note of sympathetic crying by B at 2;3 in response to my pretended crying when he was very tired and I persisted in crying after his efforts to comfort me. A note at 2;7 indicates that occasionally he whimpered when we pretended also to cry. But at 4;3 there are signs that he resents his own sympathetic crying. Thus, I pretended to cry because I could not go out with him. He said, 'No,' began to whimper and then saying, 'I don't want you to cry.' The only reason I could get for this later was 'Because you're a big man.'

The innate basis of active sympathy. Even if we recognize the conceivability of passive sympathy (or at least of sympathetic crying) being developed through experience, the acts of comforting and trying to relieve suffering which we have just recorded seem explicable only by an innate tendency, similar to that which McDougall labels the parental or protective propensity. The fact that these impulses develop so very long before the parental functions can be called for, is no proof that they are not the early ripening of that impulse. But in view of their very early appearance, and of the fact that at this first stage they may be already directed to much older and stronger persons, to animals and even to inanimate objects, it seems better to speak of an impulse to relieve suffering which is sympathetically apprehended; and such an impulse would be a valuable adjunct of the gregarious tendency. Though such an impulse may appear in its strongest form in the parents' attitude to their young, it is also shown very markedly by men and women towards other adults, and by many human beings towards small and defenceless animals. Such an impulse may then be regarded as only one, though the most important, of the various impulses which may be grouped under the heading parental or protective propensities, a view which would fit in with Shand's treatment of this subject rather than McDougall's.¹ It also approximates to Thorndike's description of the original impulse of 'kindliness', though Thorndike inclines to the view that this is probably based on the more fundamental 'motherly behaviour'.²

Solicitude and helping. I have given examples of sympathy with distress not perceptible to the senses but known to exist. A near neighbour to this is concern about a *possible* source of trouble. The situation which causes such concern may approximate to actual distress: for example, when B. C., a friend's son, aged 3;6, was our guest, his elder brother was climbing a high tree with two of my boys. When they got too high I called out (but without alarm), 'Come down,' and B. C. repeated 'Come down' and

¹ See Shand, *Foundations of Character*, p. 40.

² *Educational Psychology*, Vol. I, pp. 102, 103.

began to cry. But sometimes solicitude is shown even for the fulfilment of quite unimportant wishes of others. Excellent examples are given me by Mrs. B :

J. M. B., 3 $\frac{1}{4}$. 'Daddy, don't stand so near the fire : you'll singe !'
'Mummy, don't forget to take the matches back to your bedroom, or you'll not be able to light the fire.'

A wish to be helpful and actions resulting from it seem to be also allied to the above : and these appear very early.

In addition to wanting, even by the age of 1 ; 0, to feed their mother or me (which I shall refer to in the next section), similar care for our wants was shown often by a child in the third year. Thus

B, 2 ; 7. Very thoughtful nowadays. When I came in this morning, he said, 'Daddy want slippers,' and ran to get them.

Or it might be shown for others and especially younger children. Thus

Y, 3 ; 11. Looked after our guest, B. C. (3 ; 6), very nicely to-day : put his shoes on in a motherly way ; (he was decidedly smaller than Y at that time).

In such helpfulness, however, it is impossible to distinguish between the possible motives : (a) mere sympathetic understanding of a wish in another and the impulse to satisfy it ; and (b) genuine affection for the person helped, which embraces or at least strengthens the impulse even if it can exist as an independent impulse.

We turn now, therefore, to the study of affection.

Affection and love. In spite of the tendency in recent psychology to use the word affection as a general term for the feeling-tone aspect of consciousness, it seems the best word to use for the earliest stages of love. The term 'love' may then be reserved for the more developed sentiment, as described by Shand, and taking as the constituents of a sentiment of love, the desire for and pleasure in the presence of a person, grief at his absence, and a tendency to experience towards him pity in case of distress, and sympathetic joy when he rejoices.¹

There is no doubt that the infant first shows affection for the mother (or nurse acting as mother substitute), provided the latter attends to its needs in the first months. For the very reason, however, that the mother usually comes to mean for the child

¹ I adopt here the general description of the sentiment given by Shand in *The Foundations of Character*, and accepted by McDougall (*Social Psychology*, p. 124) and Stout (*Manual of Psychology*, 4th ed., p. 626). On the feelings involved in pity, see also J. Drever, *Instinct in Man*, pp. 196-8.

the satisfaction of its needs, and its means of comfort and entertainment, we must look elsewhere first for evidence of an innate disinterested tendency to feel affection, leaving the consideration of love for parents and of older brothers and sisters till later. The innate sympathy and active pity, of which we have given examples, are themselves of course elements in the total sentiment of affection. But it may be argued that they can be felt towards an object without that object being liked. We will now look, therefore, for evidence of affection where sympathy is not called out.

Attitude to infants of similar age. Unfortunately my own children in their first year did not often meet other babies of about the same age. A few of my records, however, and those of several others reveal a warm friendly attitude to other babies at a surprisingly early age.

B, 0; 5. M reports B and another baby of 0; 6½ showed great delight in each other: stretched out their hands to one another, though sitting with feet not quite touching. B, 0; 6½. Very interested, M said, in a baby girl of similar age in railway waiting-room: when near together they held out their arms to each other. But B took little interest in her in the train when they were in extreme opposite corners.

Dearborn writes of his child:

L, 0; 10: For the first time in her life she had hold of a little girl about her own age and it was surprising to see how delightedly she hugged her and how emphatic were the signs of instinctive natural affection for an entirely strange little girl.

L at 1; 0, after momentary jealousy of a baby who was in her nurse's lap, offered him toys and repeatedly hugged him. A week later L offered Johnnie B all her favourite toys. At 1; 8 she showed great affection for a little baby boy, and kisses his 'tiny picture now she is home'. At 1; 11 'her love for young infants is very strong'.¹

Kellogg's baby at 0; 10 made friendly advances to the young ape within the first few days of her arrival, holding her by the hand, and seeming 'delighted when she approaches'.²

On one occasion, however, B at 1; 6 when playing with a baby of his own age, resented her touching his toys at first, though after a mild reproof he gave her some.

Miss M. Shirley gives a number of examples which I refrain from quoting in detail, as it might be replied that the parents from whom she had her reports were not dependable, though Miss Shirley found all their reports of precocity could be verified, and fondness for other babies is hardly a thing which an adoring mother would

¹ Op. cit., pp. 119, 132, 134, 179, 182.

² Op. cit., p. 147.

wish to exaggerate. I give only two which are particularly definite and interesting as they refer to twins :

Winifred at 0 ; 9½ was showing her affection for Fred (the twin) by patting him. As to Fred at 0 ; 8, Crazy about Winnie is the only way to describe it. He tries to attract her attention and laughs and coos with her.¹

Of the other twins it was reported that Peter showed for his sister 'adoration and unflagging devotion'. At 0 ; 11 : 'Holds out box to Patty and talks at her in "goos and aahs" aimed to call her attention.' But Patty did not reciprocate Peter's interest, 'preferring adults, wanting to be nursed most of the time'.²

As to the other reports quoted by Miss Shirley, I will add only these comments. (i) In several cases there is a conjunction of (a) friendliness and liking for other babies or children and (b) shyness towards or fear of adults. (ii) The very emphatic wording of some reports makes it probable that there is substantial basis for them ; for example, Harry at 0 ; 10 'absolutely delighted with children and babies' (p. 92). (iii) The veracity of the parents' evidence on this matter is made more probable when we find that such affection for other infants is noted nearly always about the same age—about 0 ; 8 to 0 ; 10. In a few infants apparent liking for other children is reported as early as 0 ; 3 or 0 ; 4, but was probably mere interest. (iv) Some marked individual differences appear. For example, Irene was said to be more friendly with adults than with children—whom she seldom saw (p. 95).

Attitude towards younger infants. The strongest evidence, it seems to me, of the existence of an innate tendency to feel a disinterested affection for others, is afforded by the behaviour of some infants towards their younger baby brothers or sisters, for this has to work against the egoistic jealousy which the infant may feel if it sees attentions for which it craves being bestowed on another. Any such tendency to jealousy may be enormously increased by suggestion. I have a vivid memory of the misery I suffered when between 3 and 4 years of age I was told by a maid-servant that a baby sister had been born and that my mother would not love me any more. My own children were always told some weeks before of the expected arrival of a brother or sister, and we were very careful to avoid saying anything that would cause jealousy. Their invariable response was keen interest and delight. I give a few details of notes. I may add that I was especially on the look-out for signs of jealousy. The eldest boy at

¹ *The First Two Years*, Vol. III, pp. 82 and 85.

² *Op. cit.*, pp. 107 and 109.

2;1 was shown his baby brother in his mother's arms. Interested, but not excited. Kissed it readily on request and soon ran away to look out of the window. Wanted (spontaneously) to kiss it good-bye later. Later in the day I noted 'still no jealousy when his baby brother is petted'. The next day he spontaneously inserted both baby and nurse into his evening prayers: 'Go(d) be(ss) Daddy and Baby and Nurse.'

A week later he seemed to resent his mother's statement that baby had no teeth: he even got cross with her for saying it. Repeated signs of affection and consideration occurred—wanting to kiss baby good night, whispering as we did, in order not to waken him. A month later still finds him smiling at the baby and kissing him spontaneously, and at 2;3 I noted there was still no jealousy shown.

Similarly with the second boy when he was 2;2 and his baby sister 5 weeks, it was noted that he showed no jealousy of her. I must confess that one incident suggested another feeling. Thus: the eldest boy at 2;3 accidentally touched baby's head with his foot and made him cry. M said 'Naughty boy, you made baby cry.' A minute later I saw him kicking again towards baby's head and when M stopped him he tried again, laughed and said, 'Make baby ky (a)gain.' But momentary teasing is by no means inconsistent with normal and even strong affection. Indeed, there is no reason why we should expect affection to be an exception to the apparent rule that all new developments are intermittent in their first stage. Only one other note suggests that momentary jealousy also appeared at

2;3½. The elder boy asked me (M) to say a rhyme. I was talking to baby so I said the rhyme to him. The elder shrieked and cried 'No, no,' until I said it looking at him. Afterwards he did not mind my saying it looking at baby.

But this was surely a reasonable protest when he had suggested the rhyme!

By 2;6 the elder boy's sentiment for the baby of 0;5 was considerable. He likes to stroke and kiss him; is very gentle with him; puts his arms round him and often patting him said, 'Billie (his own pet name) like Baby.' 2;7. Is much more demonstrative to baby than to us; often wants to kiss him and puts his arms round him. This is done practically never to us except when one of us pretends to cry, and of course at regular times, like going to bed. This great demonstrativeness to a baby was noted in him as late as 4;8. At 3;5 'Very fond of baby'; affection seems instinctive. He often has to give up to baby and sees us petting him; and he himself of course gets no advantage from baby. Yet he makes a great fuss of him and began to cry in the train when he could not see baby and we pretended he had gone away.

Such a sentiment cannot surely be explained by any pleasant associations of comfort, or food, or even being entertained as the feeling for the mother might conceivably be; and it is built up in spite of the fact that the baby inevitably deprives the elder child of some of his mother's and father's attention. Indeed, the usual kindness of an elder child towards the younger was one of those things which seemed such a commonplace with all the children that I neglected to take frequent notes of it. A year or two later (at 3;0 or 4;0 and onwards) such affection would also be shown, especially by my two little girls, for babies from other families, though here there would be naturally some hesitance about handling so freely an infant not 'their own'. Dearborn remarked that even at 1;11 his little girl seemed to show more affection for a baby of 0;6 than she did for her own playmates of about 2;0.¹

Freud's views as to the relations between infants of the same family. The foregoing observations of my own and of others are decidedly opposed to the views expressed by Freud as to the attitude of very little children towards younger brothers and sisters. 'It is unquestionable', he writes, 'that the little child sees and hates his rivals. . . . Of course it often gives place to a more tender feeling or perhaps we should say is overlaid by that, but the hostile seems very generally to be the earlier.' 'We can most easily observe it in children of 2½-4 years old when a new baby arrives.'²

The above records show, on the contrary in these children, the appearance *first* of an innate tenderness towards a little brother, considerably before anything in the nature of jealousy occurs: and the records given are typical of the reactions of all our children towards their little brothers and sisters. Indeed, rarely have I known greater delight experienced by any of them than the older ones experienced on hearing that they were to have another brother or sister. And this was true of all ages from 3;10 (when Y said she would like a baby sister 'because I'd be able to push her about—and I'd be her sister') up to 10 or 12. True, the elder girl at 4;0 thought it would be lovely if the new baby proved to be a little horse (she adored horses) and at 10 she was sad for a few minutes when she heard the new baby was a girl. But she was soon devoted to her. Further evidence I quote in a later chapter (p. 327) from other reliable reports suggests that by the majority of young children no jealousy at all is shown, though after the earliest years some may manage to conceal it. Of fourteen infants under 7;0 at the birth of a brother or sister, twelve showed no jealousy of their new rivals. One did show it and one was reported doubtful. Undoubtedly, however, much will depend on the treat-

¹ Op. cit., p. 182.

² *Introductory Lectures on Psycho-analysis*, p. 172.

ment by the parents of the elder child when another is born. If the customary attention and expected signs of affection are largely withdrawn, the elder child will, of course, feel it. Even if there is no withdrawal of affection but only a preference shown, the elder may naturally be jealous. Unfortunately the parents themselves may not always be aware as to how much they reveal this preference. I remember visiting the family of a friend with two children. The parents had complained that the elder boy (about 2 ; 6) was very jealous of the baby of 1 ; 0 but seemed quite unaware of any reason for it. Before I left it was clear to me that a decided preference was revealed by both parents, and especially by the mother, for the baby. Once the boy ran up to his baby sister and smacked her : but she was then being fussed over by the mother. Later I saw the boy spontaneously go up to his sister and hug her affectionately.

I am sceptical as to whether the child who has been the youngest of several children for some time will feel jealousy especially because already spoilt, as is sometimes stated, for such a view ignores the influence of the elder children. I once tried to get the opinion of my own three older children on this point and asked if the fourth (and youngest)—a boy then 5 years old—was very sorry when he heard he was to have a little brother or sister. The question caused amusement in each of the three : ' Oh no,' was the reply, ' he was glad. He said, " Thank goodness, now I shall have someone to boss about ! " ' ¹

Affection for animals and dolls. That there is in the first and second year a genuine innate disinterested capacity for affection is also suggested by the fondness shown for animals and for dolls, which is so well known as hardly to need illustrating. All my children showed a strong affection for cats and later for dogs, not merely finding them interesting, but petting and loving them. To the sceptic who suggests that such apparent affection is merely interest due to the lively and curious behaviour of such animals I would point out that sympathy at least may also be shown. The passion of little girls and sometimes of boys for dolls seems more explicable if we assume the existence of an innate affection, a craving for expression ; and in this particular case it looks like the dawning of the maternal instinct.

At the early age of 1 ; 0 Y kissed her doll and held it up to M to be kissed. This might have been an imitated ritual. But by the period 1 ; 9 to 2 ; 0 there was also keen '*Einfühlung*' with

¹ The effects of being the youngest child are, I think, exaggerated by Dr. Blanche Weill in her book, *The Behaviour of Young Children in the same Family*, pp. 37 ff. (Harvard Univ. Press, 1928) : and by Alfred Adler in the *Education of Children*, p. 128 (London, 1930).

the dolls. I wrote at the time, of Y, 'there seems to be real tender fondness'.

Even boys may show this affection for dolls; nor can it always be attributed to emotionless imitation of their sisters. Thus Dr. E. H. Hughes, in her careful observation of her two boys, noticed that between the ages of 2 and 3 they both exhibited a 'motherly solicitude' for dolls.¹ The very fact, however, that devotion to dolls is so much more general in little girls, is itself some evidence that there is innate and genuine affection involved, if we accept the usual view that the protective impulse towards little children is stronger on the average in women than in men; though we must allow for the possible effect of suggestions made by parents that dolls are suitable playthings for little girls but not for boys. I may add here that both Y and her mother confidently assert that they could clearly remember feeling keen affection for certain dolls when very young. Later on, such affection for animals and dolls became, if anything, greater in Y. I noted at 5 years of age:

It is remarkable how affection for her kitten shows itself in spite of severe scratchings the first day or two: and her feeling for her dolls is such that she dislikes one even to pretend to hit a doll or do anything to make it uncomfortable.

So far I have confined the discussion of innate affection to the attitude shown by infants to children younger than themselves or to helpless animals or dolls. But the affection shown towards those of the same or somewhat greater age often seems inexplicable merely by services rendered. Sometimes among slightly older children such strong affection may reveal itself that two become inseparable. I give two examples:

A girl of 3; 2 and one of 3; 11 express their love for each other with great enthusiasm; they do not leave each other and hold hands tightly. None of the group plays in which they participate can separate them. Even in musical bumps they will not walk singly.²

It is still easier to find records in which affection is blended with sympathy and for which active helping can be cited as evidence. One may find such affection in children of a type one would hardly expect to show it. I select the following reports made by my daughter in a nursery school, because they refer to two children who from a point of view of general sociability were most unpromising:

K. G., age 4; 0, of low intelligence (mother for a time in mental home). I had observed him for over 4 months. He was very rough,

¹ See Thesis on *Emotional Development in Younger Children*, p. 408 (Thesis approved for Ph.D. in the Univ. of London, 1934).

² M. Etziny, op. cit., p. 193.

a member of a small gang of older boys (4;0 to 5;0), noisy and pugnacious. To-day I saw a completely new side of his character. His little brother Fred aged 2;0 came to school. F cried and howled continuously. K sat with his arms round him and tried to comfort him, e.g. pointed out his cousin, saying, 'Look, Harry's here'—offered his own milk (which he generally loves). All morning K devoted himself to his little brother: when F started crying again K sat by him with his arms round him and began to cry himself and finally said, 'I am going to take him home, he wants his mum.' Then at dinner he seemed proud of his little brother, telling the others his name. At sleep time the younger boy could only be comforted by lying in his brother's bed; and later K still sat with his arms round F, though the much-loved special wet-weather toys were out for use.

Jane, aged 3;0. Very big for her age. Often inclined to be pugnacious—suddenly hits, pinches or even bites other children and then laughs; jeers noisily at others, e.g. 'Silly old Doreen'; yet never seems very angry. Sometimes rushes up to me and hugs me and says, 'Miss, I like you.' When little Fanny (age 2) joined older children in a running round game and was in danger of being knocked over, Jane stopped her own running and took F's hand, saying, 'Come on, Fanny,' though she thus stopped herself joining effectively in the game.

Having shown the existence of active sympathy and affection in these early years towards other infants from whom no benefits have been received, we are more prepared to consider the question of affection for parents.

CHAPTER XVII

Affection for Parents and the Supposed Oedipus Complex

First signs of social response. It is difficult if not impossible to get any evidence of innate bases of affection from the child's attitude towards parents, because of all that is done for the child by the mother and father in the early months. The infant's greater comfort in the presence of the mother is well known. In earlier chapters I have shown how fear responses, and even reflexes, may vary according to whether the infant is in the arms of the mother or not. It is quite comprehensible on general grounds that the accumulation of hundreds of associations of the satisfaction of hunger and other cravings by the mother make her pre-eminent in the affections of the infant in early months.

We had ample evidence that in the early months—certainly between 6 and 12 months—there were occasions when the mere presence of the mother seemed to be satisfying, even if she was taking no notice of the child.

It is for these reasons that in discussing the evidence for an innate tendency to feel affection I have not so far referred to affection for parents. But the attitude towards parents, and especially early affection for the father, becomes all the more comprehensible if we find that such an innate tendency is shown even towards persons who have not, like the parent, contributed to the child's comfort and happiness.

In my own children there were indeed expressions of the crude beginnings of attraction towards the mother and father even before there was any recognition of their faces, so far as we could judge. We have seen that about the end of the first month there were smiling responses to a smiling face. At two months there was crying apparently for mere loneliness, indicating a craving for *some* company, quite apart from hunger or discomfort, relieved, for example, in B, by one of us approaching and putting a finger in his hand (d. 65), or by my merely coming very near. Yet by d. 78 I was uncertain whether he recognized our faces—for he gave smiling responses to a neighbour as he did to me.

Whether there was *recognition* or not by this time, we have in the smiling response to adults other than parents and in the craving for company, the first elements of social friendliness. Thus :

B, d. 72. Yapping in cot silenced when I went and stood by him

silently. Mere company sufficient—first definite proof of this. d. 78. He smiled at me when I looked at him as he lay on the couch. So I got Mr. D. to come and do likewise to see if there was any marked difference in look and smile. B smiled at him too—no marked difference.

A, d. 81. 'Talked' to lady visitor freely when held by her: apparently attracted by blue feather upright in hat.

B, d. 85. Mrs. B. called. B smiled very readily—though she was wearing a big black hat. He is now talking and laughing to her. d. 90. Quite happy in a strange woman's arms. Talking to her and gazing at her face.

Several other notes, however, at 0;3 show that B would sometimes cry violently if I went out of sight and smile and sometimes coo merely on my reappearance. Some notes show that the mere company of the parent is not always enough—there must be direct attention to the child.

d. 94. He lay happy on a chair near me at dinner, laughing at me. Later when I paid less attention he cried, then immediately stopped when I looked directly at him—though he could see my face quite well *all* the time. This happened repeatedly (five or six times). M says same happened last night. He would not rest unless she *looked* at him.

Date of recognition of parents. We thought that the quickness of the smiling response at the appearance of one of us indicated recognition by sight by about 0;3—0;3½. B's smiling reaction time on seeing me on d. 102 was only about three seconds. B's pre-food chuckle was made when his mother appeared on d. 85. It is impossible, of course, to be sure of recognition. I looked for evidence in a distinction between B's reaction to us and to strangers, but he was so friendly even to them that it was difficult to be certain. The distinction, however, was very clear in Y at 0;3. It was also just at this period of 0;3½ that Dearborn remarked that his daughter's growing silence in the presence of strangers implied a distinction between them and the parents. Darwin had no evidence of his son distinguishing or recognizing anyone till he was nearly 0;4.¹ Miss Shinn thought her niece recognized her grandfather on d. 80, but the evidence—'a joyous cry on seeing him'—is no proof,² for there may be delight at the mere sight of a smiling face at this period. Miss Shinn was 'doubtful how far the baby, at 0;4, recognized any one except her grandfather'.³ Mrs. Moore says her son at 0;2 showed that he distinguished between a familiar and unfamiliar face by smiling at the former and regarding the latter seriously.⁴ Of course, if the stranger was not smiling and the familiar person was, that might account for the difference. Sully thought that his boy recognized his father at 0;2 because

¹ *Mind*, 1877, p. 289.

² Op. cit., II, p. 68.

³ Op. cit., I, p. 15.

⁴ Op. cit., p. 46.

he greeted him with a smile, but later found the boy smiled in a similar way at another man, who, like the father, wore a beard.¹

In the nature of the case it is hard to prove recognition; and some vague feeling of familiarity possibly began as early as 0;2 in Sully's boy and Miss Shinn's niece, and before 0;3 in B. It looks as though we ought to allow for possible recognition by B and Y of the mother's face, and possibly of mine at least by 0;3.

Summing up, we may say that the evidence of all these competent observers points to about 0;3 as the age when some recognition of the parents by these children, was fairly certain: and in view of the fact that most of these children would tend to be above the average intelligence, and would mature somewhat earlier, this would fit in well with the note by Miss M. Shirley, about her group of twenty infants observed, that at or soon after 0;4 the babies distinguished between friends and strangers.²

For some months from 0;3 the chief signs which indicate the growing bond between child and parent are the following: (1) The violent crying when either M or I left him alone, and the chuckles and smiles with which we were received on return. (2) The obvious satisfaction with which he would sometimes return to his mother's arms after being in a stranger's.

That there was before 6 months a preference for the mother before the father at times of fatigue or discomfort I am quite sure, though I have no specific notes of it till later; but by 0;9 B would sometimes show distress if M left the room, even if she had been taking no notice of him, and I noted that Y, at 1;0 when she was on my knee and quite happy, cried loudly when M went out of the room.

The act of *kissing* is of little help as evidence of innate affection, for it seems to be learned through imitation. At first the child only puts its face close to the mother's in response to her movement, and soon after it may imitate the kissing sound, sometimes blowing! My own impressions, indeed, as to kissing, agree largely with those of Preyer.³ His note that his infant under one month sucked at a lip when kissed is of no significance, for an infant of his age will suck at a finger or almost anything put to his mouth. Preyer noted at 1;1: 'The child has absolutely no idea of what a kiss signifies, for he always turns away his head when he is kissed, no matter by whom.' Then he learned to 'give a kiss' when told (1;3), but only by 1;11 did Preyer think his boy realized that a kiss was a mark of favour. Miss Shinn's niece at 0;6 would still suck at a cheek and sometimes bite (at 0;10). Miss Shinn thought that by 0;11 the application of the mouth was expressive of friendliness, but does not give her reason for this.⁴ Darwin

¹ Op. cit., p. 404.

³ Op. cit., p. 305.

² *The First Two Years*, Vol. II, p. 85.

⁴ Op. cit., I, p. 389.

thought his son expressed affection when just over 1;0 'by kissing his nurse who had been absent for a short time'.¹

My own notes suggest that the earliest kisses may have varied significance. Thus:

Y, 1;0. Kissing does not seem to be an expression of feeling; it seems rather to be done as a game. Sometimes she will offer all members of the family kisses in turn repeatedly.

X, 1;0. Offers kisses when she hears anyone else kissing or when being taken out of a room; has done this for two or three weeks.

Soon, however, significance appears in the kissing: thus:

B, 1;2½. B's kisses are now a sign of either (1) gratitude or happiness, often offered when very pleased, or (2) saying good-bye. He will kiss when leaving M or me if he is willing to leave, *but not if he wants to stay*. To-day he seemed to offer a kiss to M as a hint that she was to go when Mrs. D. took him. 1;3. Climbed on top of his tub and then, when facing away from me, made kissing noises several times. He seems to do this when pleased.

1;5½. When he kissed M (by request) he insisted on giving me one and vice versa. To-day after kissing me, went off towards lawn and then turned back, went into the house, found M and kissed her.

1;5½. After kissing M and me took hold of my chin and pulled my face near M's, apparently for me to kiss her. On my doing so he released me, missed M and me again, and then again dragged me to M, and so several times. (As a contrast to this at 1;9 when M and I repeatedly kissed one another to see what he would do, he came and hit at me; this occurrence was unique so far as I know, and possibly he detected that I was teasing him.)

I am myself inclined to think that my own children did associate kissing with affection somewhat earlier than Preyer put it (1;11), but not so early as Miss Shinn and Darwin suggest (1;0). As, however, I am not adducing kissing as evidence of affection even as early as 1;6, the question is not important for our present argument.

It may be mentioned that at a somewhat later stage a kiss would be offered and demanded by a child as a sign of reconciliation after some naughtiness. It is remarkable that Professor Kellogg reports spontaneous kissing by his young ape after misdeeds, apparently as an expression of regret and a desire for reconciliation.² It is possible that kissing would eventually appear spontaneously in the child if example and training were avoided at earlier stages.

A further sign suggestive of affection is the child's *desire to share his food and sweets* with the mother or father, though this may be a type of play. Thus:

¹ *Mind*, 1877, p. 289.

² *Op. cit.*, p. 172.

B, 1; 4½, held out his biscuit and insisted on my biting it. M reports he has done this several days. Last night kept taking bottle out of his mouth and giving it to M.

1; 8. Insisted on M eating his last piece of cake—and then cried for more. Does this show lack of foresight or was it lost for a moment in a sympathetic impulse.

1; 8. B is very generous just now, offering his food to others, so to-day I *took* the piece of bread and honey offered, and hid it, pretending to eat it. Afterwards B twice refused to give me a piece even when I asked for it, though he offered it again later.

The influence of a smile in getting B to give something up which he previously refused has already been observed, and must be borne in mind when testing children of this age to see if they will give food or other treasures to others.

Differences in attitude towards father and mother. There is a significant note upon B and his mother on this point:

1; 2. Practically never cries to me (the father) when he wants anything; says 'Ta' instead and then gives up quietly if he does not get what he wants.

Then and later the mother was not unnaturally more disposed to yield to cries. It is significant that the distinction was realized as early as 1; 2. It was also noted as true of C at 2; 0.

B, 1; 5. Cried an hour after being put to bed (in a strange house) hungry, but would not take milk from me even when on M's lap—cried till M took the bottle. B, 1; 6. Pre-eminence of mother in his affections very evident during last few months, though he misses his father very much when away, wandering about looking for him.

Any discipline at this stage largely fell to the lot of the father: but the bond of affection seemed too strong to allow discipline to destroy it. Indeed, there are several notes of the following type:

B, 1; 8½. I was called in by M to help with discipline of B. Yet afterwards he was great friends with me; wanted to come to me and go about the house with me.

The greater opportunities for companionship and play with the father from about 1½ onwards led to signs of increased affection: and so with A, of whom M wrote thus: A, 2; 1. Great affection for his father, although he is strict with him.

The first declarations of affection were made by B to his mother and father at practically the same date.

B, 2; 6. Suddenly put his arms round M and said, 'B like Mummie,' and kissed her spontaneously. (He has heard the word 'like' before in reference to things to eat.) The next day he came to me in the garden, put his arm round my neck and said, 'B like Daddie.'

Several notes show that an immediate increase of affection for the father was the reward of his playing with the children at this period: and again not only affection, but trust and confidence. Thus:

2; 2. For the first time I remember, B insisted on *my* kissing his pain better, refusing M's offer. It was just after I had been playing with him a good deal. 2; 9. A very little playing with affects his feeling towards one. After I had been playing with him to-day he came up to me and said, 'I love you very much.'

Father and mother seemed to be close rivals about this period in B's affections; this in spite of the fact of the father's stricter discipline. Soon after, I noted:

B, 3; 2. B's behaviour very different now with M as compared with me. With M he argues and teases, yet sometimes he would be very responsive to M's saying when he was naughty, 'Then you're not my B.'

At times of illness and fatigue the mother was naturally in demand. There were often signs of general regression to an earlier stage at such times. A's affection for his father had already been noted at 2; 0. As to C, I have not many notes of this period, and also I had unfortunately little time to play with him during these early years.

A, 3; 3. Seems to be showing an awakening of the emotions now. The other day he came and offered his father kisses, the next day he said 'I love you, Mummie.' When asked why he said, 'Cos you're so kind.' The next day he wanted to help us in gardening.

The note suggests that such a wish to help had been rarely or never shown by A so far, though it was common with B.

With the two girls, X and Y, the preference for the mother was decidedly greater during this third year and later: and this in spite of the fact that discipline was practically never needed for X; if her mother merely said she was 'not her little girl', it was effective, as it was perhaps to a less extent, with Y.

X, 2; 5. Towards her mother she had long shown spontaneous affection—saying 'I love you.'

Y, 2; 5. Very demonstrative. For example, M was repairing Y's knickers. Y: 'You doing Y's knickers?' 'Yes.' Y throws her arms round her mother and says 'Good old mummie!' Y, 2; 6. Invents excuses at once, when M goes, to get her back. Trapped her finger a little just now. Would not let me kiss it better: asked for M and waited till she came back.

No such records suggest any similar attitude of the girls towards the father, and in reference to Y at least there are definite notes as

to the absence of any such demonstrations, though both daughters were on good terms with their father.

Affection was shown strikingly in the dislike of estrangement, especially from M. For example:

X, 2; 5. Though very self-willed and obstinate at times, can be brought round much more quickly by being told by M, 'You are not my little hen,' than by being punished. X, 2; 6. When alone with me in a room she put a dirty poker on a chair. When I reproved her she ran and put her arms round my neck and said, 'Sorry.' Then she said, 'I want to kiss Mummy.' I would not let her out of the room, but when M came in later X ran up to her and said 'I dirtied chair. Sowwy,' and kissed her.

The mother was noted as still being pre-eminent in the affections of Y at 3, and just as much at 3; 6. At 3; 11 Y would often say, 'I love you, Mummie. Mummie you are lovely.' An immediate response to my entertaining her in my study on one or two days was her putting her chair close to me to sit by me. I also gained a little for a time at 4; 0 when Y had an illness that laid her up for a time and I brought her in toys and played with her more than usual, but this gain never brought me up to the mother, and even the relative gain did not seem to last long after the recovery of Y. The only jealousy displayed by Y was either of the father or of a brother or sister, thus:

Y, 3; 5½. Saw me kissing M fondly. Said 'Dear Mummie' and came running up to kiss her. This rather typical of her behaviour on such occasions. No jealousy of M yet. Y, 3; 11. M kissed S (another child)¹ and Y immediately asked M to kiss her. Then her brother S wanted another kiss and Y flew into a rage and begged M not to kiss him. Y even struck him and said he was 'naughty'. Y, 4; 0. S kissed M at table. Y got off her chair next to M and fondled her too.

This markedly greater love for the mother continued with Y and with X through childhood. Just occasionally I noted temporary increments of affection for me; even as late as 6; 0 my playing a good deal with Y, and inventing a farm game for her, was followed by her specially wanting to sit by me at table—her usual preference being for her mother.

The records of my own children then indicate a definite predominance of the mother in the affections of all the children, till about 2; 0 to 2; 6 in the case of the boys, when the father began to gain and sometimes seemed to equal or even surpass the mother in their affections, except at times of need. Variations of feeling towards me were no doubt greater. As B himself put it when about 5; 0 (?), 'Daddy, when you're nice you're nicer than Mummy. When you're horrid, you're horrider than Mummy.'

¹ Here as elsewhere S stands for Sibling—a brother or sister.

With the girls I have no evidence of such a strong growth of affection towards the father, at least until adolescence or the near approach of adolescence. The boy B, on the other hand, at the age of about 8;9, whispered that he thought he loved me more than he did his mother; and by 9 to 10 I certainly seemed just as much loved as was the mother, perhaps until adolescence. At 11;0 when I spoke in his presence about our little girl loving her mother more than her father, he said, 'Little children are like that—they love their mother more when they are little; but when they are older they generally love their father more.' A was more delicate at the time, and naturally looked more to the mother for help: but his mother thought that I was preferred by him in later boyhood for a time.

The supposed Oedipus complex in children. Freud has asserted that after the age of about 2;0 boys begin to be passionately devoted to their mother and to be jealous of and even to hate the father, thus revealing an 'Oedipus complex'. Girls, on the other hand, develop a new devotion to the father and regard the mother as a rival. Two types of evidence of the Oedipus complex are offered: (a) one is the direct observation of children which Freud says reveals it; (b) the other is the result of psycho-analysis of adults. With this second one we shall deal later. As to (a), I can find no evidence whatever in the observations on my own children for such an Oedipus complex. Indeed, it will be seen that most of the evidence is directly contrary to it, especially the fact that the girls preferred their mother more than the boys did after the age of about 2;0 when, according to Freud, the boys should begin to turn against the father and the girls should favour him. The relations of the children to parents are exactly as might be expected on general grounds. First strong attachment, shown by boys and girls for the mother—the nurse and comforter. Later, some attraction after the second year towards the father who can enter into their play, and, if the more severe at times, can provide the most exciting delights. But this increased attraction of the father after 2 or 3 showed much more in the boys than in the girls; the tastes and interests of the girls being even at this early age more in line with the mother's than with the father's.

With both boys and girls, however, I noticed that a little attention and playing with seemed at once to have its reward in increased affection, though temporary. Apart from one incident at 1;9 described on p. 270 (when B may have thought I was teasing him), I found no signs of real jealousy, and certainly no evidence, though I was constantly on the look-out for it, for Freud's view that the son when quite a little child regards his father 'in the light of a rival who disputes this sole possession of his'. And so far as

my own little girls were concerned, most certainly neither saw 'in her mother someone who disturbs her tender relation to her father'.¹ Nor can I find any evidence for the statement that 'the little man finds his father in the way', and 'shows his satisfaction when the father goes away or is absent'.²

Of course a child would sometimes come up and want to share in caresses if it saw the parents kissing. But this applies even more to when a parent was seen kissing another child: and it applies to both a father's and a mother's caresses of a child, and so far as my observations go, was more often shown by the boys towards the father's caresses and by the girls towards the mother's.

As I have mentioned above, there are other arguments based upon the analysis of adult patients given by psycho-analysts for the usual existence of an Oedipus complex. At the moment, however, I am concerned with what Freud himself describes as what is shown by 'direct observation of children'.³ 'The sexual life of the child,' he writes elsewhere, 'mostly manifests itself in the third and fourth year in some form accessible to observation.'⁴

Freud admits the force of the argument that the special devotion of the mother to the care of the children is likely to attract their affection especially towards her. He counters this, however, by saying it does not explain the 'open sexual curiosity about the mother', and the fact that the boy 'wants to sleep with her at night, and insists on being in the room while she is dressing'. Here again I can say that according to my wife's observations as well as my own, this was no more true of the boys than of the girls; in fact, none of the children showed such a constant desire to get into the mother's bed as did the girl Y—a desire which continued at least until 10;0. Indeed, Freud himself in later writings admits that the girl's love for the father may be preceded by a phase of equally strong and passionate attachment exclusively to the mother, and that the duration of this attachment to the mother had been greatly underestimated; in a number of cases it persisted well into the fourth year.⁵ To this we shall return later, but I may say at once that both girls X and Y showed a much stronger attachment to their mother not only in infancy but through childhood and at least up to adolescence.

Furthermore, special curiosity about the mother, where it is shown by boys, can surely be largely accounted for on quite general lines. The infant boy is naturally interested in his own body,

¹ *Lectures on Psycho-Analysis*, p. 174.

² *Op. cit.*, p. 279.

³ *Op. cit.*, p. 279.

⁴ *Three Contributions to the Theory of Sex*, translation by A. A. Brill, p. 40 (New York, 1925).

⁵ *International Jour. of Psycho-analysis*, Vol. XIII, Pt. 3, 1932.

and puzzled and curious when he discovers that a baby sister is somewhat different from him. This curiosity about girls is accentuated by prohibitions; and the mere banishment from his mother's room when she is dressing is enough to stimulate curiosity. I have just, as a confirmatory test, if it were needed, tried a little experiment on my children. I brought into the room when all were assembled for a meal, a small box, which I said must not be opened by any of them. The box—an empty one—was put on a shelf. One after another of the children began to ask earnestly what was in it—several tried guesses: the youngest (age $7\frac{1}{2}$) pleaded with me to tell him. After an interval one of them would return to the question, and when the meal was over a boy of 16 came up and privately asked what was in it. Questions continued to be put about it for several days afterwards and indeed by the youngest for several weeks, until I revealed the plot. Thus mere prohibition was enough to excite intense curiosity, and so it may be in reference to sex matters, including the difference between boys and girls and any prohibited sights. The idea that curiosity about sex implies accompanying sex impulses seems to me a purely gratuitous one. The whole question of sex-development will be discussed in the next chapter: and I shall there give examples of families where no secret was made of the sex differences between father and mother, both exposing themselves naked regularly before their children, and the latter showed no special interest in such differences.

The fact that a number of neurotics (or of persons who, attracted by Freudian views or interested in their own abnormalities, undergo psycho-analysis) recall sex impulses in early childhood, is no proof that they are at all general: apart from the fact discovered later by Freud himself that in many or most of such cases, the 'memory' is an 'illusion' and the idea is really a 'retrogressive phantasy'.¹ He writes further: 'I was at last obliged to recognize that these scenes of seduction had never taken place and they were only phantasies which my patients had made up or which I myself had perhaps forced upon them.'²

Later Freud concluded that these phantasies were not suggested by him but were the workings of the Oedipus complex. But it is always possible that many of the ideas arrived at in the process of analysis are reached through the involuntary guidance of thoughts and imaginations by knowledge as to the views of the psycho-analyst.

If one whom I knew to be a Freudian asked me to let my ideas run freely, it is certain I should soon be thinking of things I knew him to have in mind. That is an example of a tendency familiar to all who have done elementary experiments on the association of ideas.

¹ *Lectures on Psycho-analysis*, p. 282; *Collected papers*, Vol. I, p. 276.

² *An Autobiographical Study*, p. 60 (London, 1935).

As to what may really be found in the process of psycho-analysis and what suggested, I may quote Dr. C. S. Myers: ¹

Those who wish to see to what lengths Freud and his followers are prepared to go in bringing such suggestion into play on their subjects should read his published *Analysis of a Phobia in a Five-Year Boy*. So innocent Freud seems of the dangers of suggestion that he can write: 'If I say to you, "Look up at the sky and you will see a balloon," you will find it much more quickly than if I merely tell you to look up and see if you can see anything.' Freud observes that 'an experienced physician does not meet his patients unprepared and, as a rule, asks of them not elucidation but confirmation of his surmises'. In other words, the psychoanalyst is so certain of his own interpretation of the patient's revelations that his main task is to convince the latter of the truth of them. 'Denial at the beginning', says Freud, 'should not mislead the physician; every resistance is finally overcome by firmly insisting on what has been inferred and by emphasizing the unshakable nature of one's convictions.'

Surely this attitude is the explanation of Freud's earlier insistence that 'an infantile history of seduction by adults or other older children' was characteristic of and chiefly, if not wholly, responsible for subsequent psychoneuroses. A few years later Freud had to admit that many accepted histories of such early seduction were found by him to be purely fictitious and imaginary. Is it not likely that Freud's conviction, based on a few possible real instances, led him to suggest (no doubt quite unconsciously) to his hysterical patients that they had been violated in early life and that these patients had finally accepted the suggestion? But Freud is satisfied with relating such seduction phantasies—as they turn out to be ('memory romances', as he calls them)—to the repressed memories of other infantile sexual experiences on which they were founded and to the hysterical symptoms into which these had become transferred.

Meanwhile, the evidence from direct observation of the existence among normal children, of sex impulses directed towards the parent is of the flimsiest. True, it would be a difficult thing for anyone to publish any positive records of such observations on his own children, and for that reason I issued a questionnaire, to be described shortly. In the meantime, the very definite negative reports of the kind I have given above are relevant: and the important support of so cautious an observer as Wilhelm Stern can be enlisted against the idea of an Oedipus Complex in children based especially on the study of his two girls and one boy.² Professor McDougall, the father of four children, regarded the doctrine of the Oedipus complex as fantastic.³ Dr. C. S. Myers, who had five children, maintains that there are no grounds for concluding that in childhood

¹ From *A Psychologist's Point of View*, p. 112.

² *The Psychology of Early Childhood*, p. 516.

³ See *Psycho-Analysis and Social Psychology*. Appendix IV (London, 1936).

an 'incestuous love choice is in fact the first and the regular one'.¹

Before giving the results of the questionnaire on this point we may consider briefly the comparative attitudes of fathers and mothers towards sons and daughters.

The parent's attitude to the child of the same and the child of the opposite sex. Freud's doctrine of the Oedipus complex is apt to gain some plausibility from the fact that many fathers may feel a greater affection for their grown daughters than for their sons, while many mothers may prefer a son. I say 'may' because this itself, so far as I know, has never been shown by substantial evidence. I am, however, ready to grant that it may often be true; yet even so, such preference may have nothing to do with sex in the strict sensuous sense. If it be true that, in general, men admire especially the qualities which characterize women more frequently than men—their personal sympathy, gentleness, unselfishness in little matters, and so forth—then so far as these occur more frequently in daughters than in sons, fathers will tend to prefer their daughters. Similarly most mothers will tend to admire especially the (on the average) greater strength, independence or push, &c., of the sons. And reciprocally many children when at an age to appreciate these qualities, perhaps by adolescence if not before, may (other things being equal), prefer the parent of the opposite sex more frequently than one of their own sex: and if parents prefer them that is likely to accentuate their own liking. But this again would have no connexion whatever with sexual impulse proper unless one is prepared to accept the Freudian doctrine that all affection is sexual—of which more later.

A questionnaire on the attitude towards parents and the development of sex in infancy. My own observations only refer to a few children and it might be objected that the usual preference of girls for the father can be inhibited if the father is sufficiently unlovable! I can at least plead in answer to this the strong attachment of the boys during this supposedly critical period of the third, fourth and fifth years. In view, however, of the need of further evidence on this important topic I drew up a questionnaire to which I have already referred in the section on Jealousy and submitted it to sixteen friends whom I thought to be thoroughly competent to make exact and impartial reports on their children. One of these proved to have no child older than three years, so that the reports were of no use for this part of the questionnaire, but some reference will be made to them in the next chapter. In the covering letter of this questionnaire I explained that I was submitting it to a group of friends and that all results would be

¹ *A Psychologist's Point of View*, p. 106 (London, 1933).

amalgamated and published anonymously. I added that I was adopting this plan partly because positive reports might not be published by parent-psychologists.

The sixteen friends to whom I sent this questionnaire comprised the following:—eight teachers of, or writers on psychology, two at least of whom enjoy a world-wide reputation; five former students of psychology who have since continued their studies of childhood; two professors of a natural science (one a Fellow of the Royal Society), and one other lecturer in scientific subjects. I also filled in the questionnaire myself. There are a number of details about my own children which I have not yet reported, and my results are included with the rest. I refrained from sending the questionnaire to anyone whom I knew to be antagonistic to Freud's main views, or to anyone I knew to be strongly committed to his support. The total number of children was 24 boys and 15 girls, though not every child was reported on at each age here dealt with. In nearly every case the children were still young, that is under seven or eight. Of the exceptions one was that of a distinguished psychologist who had made notes of his children during childhood and was fully alive to the unreliability of memory. Another reported on only one child and was also thoroughly versed in experimental psychology, being himself a teacher and author.

The questionnaire was as follows:

Questionnaire

Note (a) Please refer (in order of age) to boys as A, B, C, D and to girls as W, X, Y, and Z; also to Father as F and Mother as M.

(b) Please give present ages of children. Or, if these are all grown up, the average age may be given, to indicate the length of time memory has to contend with.

N.B. In all questions, blanks will be taken to mean entire uncertainty.

1. Which parent, if any, was dominant in the affection of the child? If equal put =; if doubtful, with some probability one way or the other, put F? (or M?).

A B C D W X Y Z

Ages 1.

2.

3.

4.

5.

6.

7.

and so on up to 18.

2. Can any reasonable cause be assigned for any changes given under 1? And what signs are taken as evidence for the changes?

3. Was adolescence begun (boys 13-15, girls 11-13) without any signs of a change in affection of child given towards (a) father or (b) mother? If not, please give signs of the change and specify the child (A, B, &c.).

4. Which parent undertook the more severe discipline in connexion with each child at various periods?

5. What signs were there, if any, of special sex-interest of a boy towards the mother or a girl towards the father or of a child towards a parent of the same sex? Please give approximate age, if possible.

(a) during infancy; (b) during childhood (say 5 to 12 or 13); (c) during adolescence.

6. Is anything under 5 (especially 5a or 5b) such as could be explained by a general tendency to be curious about the unknown or forbidden?

7. Were there, at any period of infancy, childhood or adolescence any signs of jealousy shown by a child because of affection displayed (a) by one parent to another, or (b) by parents towards another child? If so, please state, as to (a), sex and approximate age of child, and parent of whom jealousy was shown; as to (b), sex and age of child of whom jealousy was shown and as regards which parent.

8. Can you add any relevant observations not covered by the above questions, e.g. the earliest signs of sex interest or feeling of child as regards (a) himself, (b) sisters or brothers, (c) others?

The memory of parents is of course fallible and liable to bias; but it should be remembered that the replies were made jointly, and if there was any doubt felt, the parents were asked to express it. In any case, the considered judgements of carefully selected parents are surely better than the vague statements so often met in the discussion of these topics unsupported by any evidence, for example, that of Freud quoted above that 'little boys hate their fathers'. And even good Freudians quote the reports of parents. Dr. Susan Isaacs, for example, makes special use of the reports on the girl Ursula by her mother,¹ and of reports by many unselected parents who wrote to her about their children through the medium of a magazine.²

Signs of preferences. These when mentioned generally refer (a) to preference shown for the company of F or M (e.g. 'seeking F's company on almost all available occasions') or to such signs as (b) 'takes mother's side on all occasions', (c) spontaneous expressions of affection, e.g. 'I love you, Mummy!', (d) kissing and hugging, (e) distress at F or M leaving the child.

First let us consider those children reported on at least up to 5 years of age, to see what changes take place in these supposed critical years at 2;0, 3;0, and 4;0.

Table I gives the preferences; for this table a few marked M?

¹ See *Social Development in Young Children* (London, 1933).

² *Ibid.*, p. 27, and *Brit. Jour. of Educ. Psych.*, Vol. II, 1932.

are counted as M, and = ? as =, and two marked ? are counted as equal.

TABLE I

Boys

	Year	1	2	3	4	5
Preference for Mother	.	14	13	10	9	9
Liked equally, or doubtful	.	4	4	6	6	6
Preference for Father	.	0	1	2	3	3
Total	.	18	18	18	18	18

Here we see at the ages of 3, 4, and 5 actually a *decrease* in the number of boys who preferred the mother, and a small increase in the number preferring the father or liking him as much as the mother.

Girls

	Year	1	2	3	4	5
Preference for Mother	.	10	10	8	8	7
Liked equally, or doubtful	.	2	1	2	2	3
Preference for Father	.	0	1	2	2	2
Total	.	12	12	12	12	12

Here also we find some decline in the number of mothers preferred, but it is actually less marked than it was among the boys.

Let us now consider the whole range of years from 1; 0 to 14; 0, excluding children who could not be reported on after the age of 3; 0. It will be understood that the number gradually decreases as the present age of various children is reached.

Below the actual numbers are given the scores of Fathers and Mothers respectively, the scoring being according to this scale:

The plain statement 'Mother preferred' indicated by—

M	scores 3 for Mother	F? scores 2 for Father
M?	" 2 " "	F " 3 " "
= or = ?	" 1 " "	

and 1 for Father

The mark ? scored nothing for either as indicating complete uncertainty.

Considering the *scores* in Table II (p. 324) we note:

(1) The *Fathers* become more instead of less popular with the Boys during these ages of 3, 4, 5 and 6, as compared with 2; 0.

The father's score with boys at 2 yrs.	is	$\frac{6}{54}$	= 11%	of possible score
while the " " " " " 3 yrs.	is	$\frac{11}{54}$	= 20%	" " "
and " " " " " 4 yrs.	is	$\frac{13}{54}$	= 28%	" " "
" " " " " 5 yrs.	is	$\frac{15}{54}$	= 28%	" " "
" " " " " 6 yrs.	is	$\frac{17}{54}$	= 23%	" " "

TABLE II

SUMMARY OF QUESTIONNAIRE RESULTS

Preferences of children on whom records were made at least up to 4 years
18 Boys

Ages	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Mother	13	13	8	7	7	7	7	5	5	4	3	2	2	1
Mother ?	1	—	2	2	2	2	2	1	1	—	—	—	—	2
= or = ?	3	3	5	6	6	6	4	3	2	3	3	2	2	1
Father ?	0	—	—	—	—	—	—	2	1	1	1	—	—	—
Father	0	1	2	3	3	2	2	1	2	2	2	4	3	3
?	1	1	1	—	—	—	—	1	1	—	—	—	—	—
Total	18	18	18	18	18	17	15	13	12	10	9	8	7	7
Mother's score . .	44	42	33	31	31	31	29	20	19	15	12	8	8	8
Father's score . .	3	6	11	15	15	12	10	10	10	11	11	14	11	10
Max. Score . .	54	54	54	54	54	51	45	39	36	30	27	24	21	21

13 Girls

Ages	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Mother	11	11	8	8	7	8	4	3	2	2	1	1	1	2
Mother ?	—	—	—	—	—	—	1	—	—	—	—	—	—	—
= or = ?	1	1	2	2	3	2	3	3	3	3	3	3	3	2
Father ?	—	—	—	1	—	—	—	—	—	—	—	—	—	—
Father	—	1	3	2	2	1	1	1	2	2	2	1	1	1
?	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	13	13	13	13	12	11	9	7	7	7	6	5	5	5
Mother's score . .	36	34	26	26	24	26	17	12	9	9	6	6	6	8
Father's score . .	1	4	11	10	9	5	6	6	9	9	6	6	6	5
Max. Score . .	39	39	39	39	36	33	27	21	21	21	18	15	15	15

(2) The *Father's* scores with *girls* are remarkably like those with the boys.

Father's score with girls at 2 yrs. is $\frac{4}{39} = 10\%$ of possible score
 " " " " 3 yrs. is $\frac{11}{39} = 28\%$ " " "
 " " " " 4 yrs. is $\frac{10}{39} = 26\%$ " " "
 " " " " 5 yrs. is $\frac{9}{36} = 25\%$ " " "
 " " " " 6 yrs. is $\frac{5}{33} = 15\%$ " " "

The scores of the *Mothers* are also very similar with boys and girls; but at every age they are more popular with the girls.

Boys

2 years. 42 = 77% of max. possible score.

3 years. 33 = 61% " " "

4 years. 31 = 57% " " "

5 years. 31 = 57% " " "

6 years. 31 = 68% " " "

Girls

34 = 87% of max. score

26 = 66% " " "

26 = 66% " " "

24 = 66% " " "

26 = 78% " " "

Thus these figures considered in different ways are against Freud's assertion that the father is increasingly disliked by boys after about two years, and also against his assertion that the girls' devotion, though continued in some cases for the mother into the fourth year, turns to the father then except for those women who remain arrested at the original mother attachment 'and never properly achieve the changeover to men'.¹ There is only one preference for the father among 11 girls at 6 years, one preference among 9 girls at 7 years and one among 7 at 8 years. Where there is a definite change in the preference shown by a child there are usually good reasons to account for it. I give next the explanations given by the parents in making their reports.

Reasons given for changes in preferences for a parent

The roman numerals are the numbers given to the various families reporting

Family

- I. A and B (preference transferred from M to F). About eight began to understand father's attitude as to discipline better.
- II. A at 8 (M to F) went away to school and correspondence with father began. B at 2 (M to F). Father's partiality for B.
- IV. A at 5 (= to M). Came under discipline of father more than before.
- VII. A at 3 (M to =). Began to be contemptuous of females, probably because of unwise nurses.
A at 5 (= to F). When we got a car F drove and this drew A to F.
At 8 (F to =). Began violin with mother so they share interests.
- XIV. A at 3 (M to F). Partly due to birth of W, when F made definite effort to engage A's interest and affections.
A showed great interest in F's care of garden and car and repairing jobs in the house. A referred to himself at this stage as the helper-man. This change began before the birth of W, when A was 3; 6.
A at 6 (F to =). Going to school made A more independent and gave him interests and friends outside the family. Also, when mother recovered from birth of B, A was able to join her in skating and swimming. F not now able to help.

Family

- II. W at 3 (M to F). Mother's function in disciplining this difficult child.
X at 3 (M to =). As in other children, lapse of period when M naturally predominates.
Y at 9 (M to =). Seen more of father during past three years.

¹ Article on Female Sexuality, in *Int. Jour. of Psycho-analysis*, XIII, 1932, pp. 281-2.

- VI. W at 4 (M to F). W begins at 4 to like F better because he plays with her.
- VII. W at 7 (M to =). Health delicate till 6 and father absent during war.
- W at 14 (= to M). Growing interest in clothes.
- XI. W at 2 (= to F). F on holiday took full charge of W when X was born. W was very excitable and nervous about strangers, and was upset by coming and going of nurses. F petted W excessively and was always with her while M busy with X.
- W at 6 (F to M). Due to W's illness. M in constant attendance.
- X at 5 (M to =). F having had to attend to X for a year. In this illness of W, X was very jealous of M's attention to W.
- XIV. W at 3 (M to F). Change after W was 2; 0 was due partly to birth of B (W being 1; 6) which absorbed M's attention and caused F to make efforts to engage W's interest.
- W at 4 (F to =). Probably in transition stage now to =. M is able to give her more attention. But F is good to her in evenings and week-ends. W romps with him but imitates her mother in play with dolls. M is invited to join in this more than F. W often now refers to 'we mummies'!

The general trend of these reasons for changes makes it the more understandable that the averages of the fathers' scores for the years 3, 4, 5, 6 and 7 are about the same for boys and girls.

Discipline and its relation to preferences. Question 4 of the questionnaire asked which parent undertook the more severe discipline. The figures on this topic support on the whole the contention that discipline is one factor in determining affection, the more severe parents at a given period scoring only 33 preferences, the less severe 55, during the period 2; 0 to 7; 0. The severe parents' score would have been much lower had it not been for the fact that so often the girls (of 2 to 7) persisted in preferring the mother even when she was the more severe. These accounted for 22 of the preference scores. With about half the girls of 3 and 4 and one-third of the boys the discipline was said to be equally shared: and where there was no preference for one parent it hardly seemed worth considering the discipline: thus the numbers are small, especially after 7 years, so none beyond 7 years were included in the figures given. Also some parents stated that with some particular child the mother had done most of the disciplining, but that the father had carried out any severe discipline. In such cases the father was put down as the more severe disciplinarian which the question asked for, but no doubt continuous if milder discipline might have more effect on affection. Among these children, it appears that the father, if the more severe disciplinarian, was *never* preferred by any boy or girl aged 2, 3, 4, 5, 6, or 7 (and only by one boy at 8 and 9).

Evidence that there is some connexion between the severity of discipline and antagonism even at early ages, comes from a very different source. Malinowski in his investigation among the *Trobriands* where uncles and not fathers brought up and disciplined the children, found 'uncle complexes' and not father complexes and he states that in 'matrilineal conditions the hate is removed from the father and placed upon the maternal uncle'.¹

Jealousy shown by children. The reports as to jealousy of a younger brother or sister at or shortly after birth may be summarized as follows: of course the numbers are reduced by the fact that there could be no such report as to only children or as to the youngest child. I had reports on fifteen children between the following age ranges; youngest 1; 10 at birth of next child and 2; 10 at time of report, to oldest 5 years at birth of next child and 11; 0 at time of report.

No jealousy was shown by 10 out of 15 children.

The records of the others were as follows:

One child of 13½ at birth of next child. No jealousy shown

Slight signs of jealousy in 1 child of 12 yrs. because of unequal treatment

"	"	"	"	I	"	"	8	"	Said he was grumbled at more when sister was 4; 0 and not liked so much, which was probably true
---	---	---	---	---	---	---	---	---	--

"	"	"	"	I	"	"	7	"	At birth of another child
---	---	---	---	---	---	---	---	---	---------------------------

Doubtful—only as to 1 child at 3; 0

Unhappy at mother's absence

I	"	"	3; 0 to 4; 5	At 4; 6 there was jealousy and his younger brother at 3; 0 was jealous of him—but as to property chiefly.
---	---	---	--------------	---

The only other comments on jealousy are as follows, dealing partly with jealousy of parents:

Family I. X at 3½ wants to kiss mother when father is seen kissing her. I think all our children up to 4 or 5 have shown a desire to be petted by either parent when they have seen another child being fondled. One boy showed something like this even at 17 and one girl still shows it at 10, but almost always it is the mother's petting that causes her jealousy.

Family VI. W, 3; 6, has shown no sign of jealousy towards her baby sister except that she is always wanting me (the mother) to carry her, because, I suppose, she sees me carrying the baby; also when watching me feed the baby she wanted to suck my breast (this was half in fun).

The first time F came home from an inspection lasting four days she

¹ *Sex and Repression in Savage Society*, p. 139 (London, 1927).

pretended to be ill. We thought this was because she was jealous that my attention was given to F instead of to her.

Family XI. This note refers to a girl W, aged 7 ; 6 at time of report, and her sister X, aged 5 ; 8 at time of report. W showed some displeasure (during period 0 ; 9 to 1 ; 6) when either parent showed affection for the other, but never when affection was showed towards X.

X was extremely jealous and angry at any affection displayed by mother for any other person or object other than herself. But she repelled advances from anyone else including father and W. After 1 ; 6 became more reconciled to advances of father. At age 4-5 years X was intensely jealous on account of the attention mother was obliged to give to W, who was ill. Her disposition seemed to change, for whereas X had previously seemed placid she now became subject to fits of rage. These were not directed against W or anyone in particular, but occurred whenever her will was crossed.

Family XIV. This last note refers to the boy A, aged 7 at time of report, with a sister W 4 years and a brother $2\frac{1}{2}$ years old. A showed jealousy from the age of 2 ; 0 onwards at affection shown by father and mother. Jealousy was shown by playful attack of father, or trying to pull him away from mother. Still shown occasionally, but sometimes now is just imitated, e.g. if F kisses M good-bye on leaving for a walk in the morning, A will do the same (ordinarily he does not kiss M on leaving for school).

We do not think that B and W have shown definite jealousy at affection displayed by father and mother.

Summing up these parts of our inquiry, we may say that the preferences shown by boys and girls do not fit in with the supposed development of an Oedipus Complex, but rather they support the ordinary explanation of affection based upon the usual greater devotion of the mother to *all* infants in the first four or five years. The facts as to discipline and its relation to preference also support this, as do the few facts about jealousy.

So much do the attitudes of the children seem determined by these various fairly obvious reasons that two of my most acute observers and careful reporters found great difficulty in answering the question about preference: the parents of one family indeed, refrained entirely and I was unable to use for the tables above the notes on their three children; but they are further evidence of the views I am suggesting and so I quote them here. They refer to three girls, ages 2 ; 0, 7 ; 0 and 10 ; 0, and one boy aged 5 ; 0. The father is one of my former advanced students. The mother (a Cambridge graduate with considerable psychological ability) writes :

I should say that if it is a question of making things, drawing, gardening, riding or playing, then the children like to be with F because he is not often available and he does these things better than M. But if they are ill, hurt, or in any kind of trouble, they prefer M. They do not show much

affection towards F as he is not demonstrative with them. M is more demonstrative and this they return. If M goes away from home they make a great fuss on her return. F is continually away and next morning when they see him after five days' absence it is only the eldest who will say 'Hullo, Daddy'. The other three go on with their breakfast! They are equally fond of both parents, but are so used to F going away that they regard it as a matter of course!

As to *jealousy* she continues:

From 2; 0 onwards, if one child complained of a pain another was sure to say he or she had one too, or if one is ill in bed a day or two later another one would pretend to be ill. The eldest has just grown out of this habit. If I take one on my knee the other three try to push her or him away and take the coveted place. If I praise one of the two elder girls for riding well or doing well at school or playing the piano well, the other girl will start making excuses why she has not done so well, though nothing was said about her. This does not apply as yet to the 5-year-old boy. The two little ones always stick up for one another, one will weep if the other one is punished and will attack the grown-up who is punishing the other one. I am afraid that is all I can do for you and I *fear* it is not what you want.

I quote that last sentence because it shows that the writer thinks I expected, and perhaps desired, more positive signs of jealousy; and it indicates that at least the questionnaire did not suggest that such and other signs were in my opinion unlikely.¹

I should like to quote the admirable report of one other collaborator who went into detail in answering Question 1. This writer is a well-known University teacher of Psychology.

I find this a terribly difficult question to answer. Three persons come into the picture: M, F, and N (Nurse). F, of course, is in the background for about the first twelve months. He is perhaps a rather entertaining figure and in this respect can probably claim some priority over the dog (a large Airedale and a by-no-means-unimportant member of the family circle). From about the end of the second year M, F, and N are definitely objects of *affection* (as distinct from ministrants to appetites, needs and consolation) and affection is fairly impartially distributed. At no age could we say with assurance—with regard to A at any rate—that

¹ One further testimony as to jealousy of a new baby is given me by Mr. W. D. Wall. Of his boy R at 6; 6 he reports: 'At the time of J's birth R had been taken into confidence at early stages. He occupied much time in making doll's house for the new baby, setting some of his toys aside for her, and looking after his mother, e.g. seeing that she drank her orange juice. Immensely interested in J from birth: said he would rather have her than a Christmas present. Though he has had to put up with much less of his mother's company and attention R has never shown the slightest sign of jealousy of J. She is "our baby". Tried to stop his whooping cough for fear of waking J and showed acute anxiety when J had whooping cough.'

either M or F or N was generally or on the whole dominant. The position was rather that *M, F, and N would be dominant in their appropriate situation*. It is generally regarded as a special treat when M takes charge of A (on N's half-days, &c.), but this is not inconsistent with a general preference for N to minister at the bath, &c. (if only because N is more skilled at that sort of thing, or perhaps because natural conservatism prefers the rule to the exception). F has been pretty consistently dominant in all matters of play—recreation—that is his sphere of efficiency. In this neither M nor N can compete. F is essentially the fair-weather companion. If anybody's fingers get pinched or anybody's head gets bumped it is to M or N that one goes for comfort.

In the case of B the question of preference is much more difficult. In general one is tempted to say that he loves N even more than he loves M or F. And yet there are dozens of incidents which suggest that there is something distinctive in his attitude towards M and F—incidents which tempt even rational parents to play with mystical ideas concerning the instinctive bond of parent and child.

It should perhaps further be recorded that N darkly hints that F prefers A to B. F quite honestly professes complete equality and impartiality in his affection and explains the apparent preference for A in the following way. B is a more independent character than A. He likes doing things for himself while A prefers to organize F's activities on his behalf. B prefers to build an inferior tower of bricks to the superior towers which F might build. A is cursed with ambitions beyond his abilities and so prefers F to construct the sort of tower he desires. Hence F in fact spends more time slaving for A than he does for B.

An incidental consideration is that (according to a consensus of opinion) A is temperamentally akin to M, B inherits more from F. Hence it would be plausible to suggest that what F finds attractive in M he finds attractive in A, and what M finds attractive in F she finds in B. But naturally neither M nor F admit these implied preferences.

In general, N is staple bread and butter in the emotional life of A, whilst M and F are jam. And one likes different kinds of jam on different occasions. M and F have their innings and their outings. N will say, 'Daddy is greatly in favour in these days.' And at other times it is obviously M who holds the field. For such temporary preference no explanation can be given; and they make it quite impossible to assign any general or consistent preferences.

Subject to all these qualifications I might attempt to indicate certain slight tendencies to preferential tendencies. (These are included in the records.)

Summing up the results of this questionnaire we find that from every point of view—the preferences for M or F at different ages, by boys or girls, the reasons for changes in preferences, the influence of discipline, the occasions of jealousy—all these give ample reasonable explanations of the facts and supply no evidence of the supposed Oedipus Complex.

CHAPTER XVIII

The Development of Sex and Sex-Interests in Infancy

Questions 5, 6 and 8 of the questionnaire, which have still to be dealt with, introduce the question of the development of sex, about which some preliminary remarks may be made.

The distinction between (a) interest in sex and (b) true sex impulses. First it is important to distinguish between the development of sex impulses or feelings and the beginnings of an interest in sex. Some psycho-analytic writers quote curiosity about sex as evidence of sex-development; whereas while sex maturity no doubt usually results in an interest in and discussion of sex affairs,¹ we may expect curiosity about sex organs and sex differences, without any sex feeling, at least as intense as curiosity, say, about the life and structure of strange animals; and this may be very keen in infancy.

Indeed, as some psycho-analysts themselves have stressed, one of the first things an infant is interested in is his own body. In the first months he spends hours in examining his own fingers, toes, hair, &c., and the genitals first come into the field of exploration as mere parts of himself. The first playing with them may be precisely similar to the first playing with his toes.

Again, the questions as to how babies are born are solemnly referred to by some psycho-analytic writers as indicating general sex interests. They can hardly have lived in the same house with a few active-minded children of about 3 years of age, during the period when the 'why' questions are rained on parents and others about scores of things of great and little interest. A note of mine on B at 2; 11 as to his constantly asking 'why' adds that 'the question seems to be about every third remark of his'.²

Is it surprising that the arrival of a new baby in the home or in the home of a friend, causes intense curiosity as to its origin? Or again, a baby's most perpetual plaything in his first year is his own body; he explores hands and feet at first apparently with wondering interest. His genitals come in for a similar interest.

¹ I do not think, however, that the two are always closely correlated. I suspect that some strongly sexed people are loth to discuss the mechanism of sex, and some cold-blooded bachelors love to chatter about it.

Professor Burt comments that the psycho-analytic argument is as illogical as it would be to contend that anyone who feels a strong curiosity about criminal tendencies must therefore have strong criminal tendencies himself!

² See Chap. XXI on Thought Processes, p. 439.

Is it not to be expected that he will be astonished to find a difference here when he first sees a little girl: and again that he will ask perpetual questions until satisfied? Curiosity about such matters—the origin of babies and bodily differences—will only be stimulated still further by reticence of adults, and an impression that the child feels some guilt in connexion with the question (as suggested by Freudians) can easily be explained, if as usual, adults suggest that such things ought not to be thought about, or are ‘naughty’. The little child may quickly sense the atmosphere of constraint and disapproval even if, as I think likely, he persists in his interests and ask questions in a somewhat shamefaced way. When there is none of this restraint by the parents there is likely to be a more frank and open attitude.

Our children were told, as soon as they asked the question, that the baby grew inside the mother and came out of her; and never was there anything which suggested a furtive interest or sense of ‘guilt’ or shame. Indeed, the frankness was sometimes embarrassing; for example, one of my boys (then aged 7), when we were staying at a farm came one day into our room and said, ‘Daddy, a cow is going to be taken to the bull. Can we go and see it?’

In three of the families reported on in my questionnaire, the parents had the courage often to appear naked when their children were present, from earliest infancy, and they reported an absence of any special interest in sex-differences.

The supposed signs of sex-development in infancy. In considering further evidence of sexuality in infancy we must bear in mind the wide interpretation Freud gives to sexuality. For him because the enjoyment of contact of lips on lips is an element in sex-relations proper, therefore all enjoyment through the lips is sexual, even if it occurs in infancy.

His view seems to involve both logical and psychological fallacies. Logical in assuming that because all A is B, all B is A; psychological for assuming, for example, that kissing when unaccompanied by sex attraction for the person kissed is identical with kissing when it is so accompanied: and also that lip contact in sucking gives a similar sensuous enjoyment to that in kissing.

It seems to me probable that the infant’s pleasure in sucking the breast is largely, if not entirely, the pleasure of satisfying hunger. Indeed, I frequently saw my children vigorously eject the nipple from their mouths when satisfied, and turn away when the mother tried to continue the feeding.¹ The ease with which weaning

¹ Fantastic interpretations (in two senses of the word ‘fantastic’) are sometimes given of the baby’s attitude to its mother’s breast. As Dr. G. A. Auden says, ‘It is stated that “Babies of a few months of age certainly

usually takes place is also significant. In a special study of *Feeding Behaviour of Infants*, Drs. Gesell and Ilg write: 'As soon as a bottle is offered under such conditions' (the failing of the mother's milk) 'the infant frequently shows an unmistakable preference for the bottle as opposed to the breast: and there may be difficulty in continuing partial breast feeding even if the mother wishes it.'¹

The fact that at other times, the baby would suck its thumb is quite understandable on the ground of the general tendency to exercise any capacity. Even meaningless, spontaneous movements, as we saw, are constantly taking place in the first months. Sucking is a strong innate tendency, whether pure reflex or instinctive, which may occur even before birth,² and which is essential for the very existence of the individual. Freud himself in one place refers to it as part of the nutritive instinct.³ Even the continuance of thumb-sucking long after the weaning, or the sucking of pencils, the biting of nails and chewing of chewing-gum—all such activities of the mouth seem quite comprehensible as the continuance of a fundamental impulse quite independent of sex, beginning as a kind of play, and becoming fixed as a habit, which, so far as our observations of thumb-sucking went, was indulged in, if at all, almost entirely when going to sleep. It seemed to have a suggestive value; but so had also for B a certain eiderdown which he held against his face; and similarly a beloved doll seemed to have a suggestive value for Y. (See Chap. XIII.)

The importance of mere habit in the process is shown clearly by the following facts. In the very early months B and Y became accustomed to sucking the *right* thumb. When we wished to break them of the habit of sucking the thumb while going to sleep, indulge in fantasy building" and "that the object of all these fantasies is, to begin with, the breast of the mother, which becomes imbued with the characteristics of good and evil". Further, "this can be explained by the fact that when the child turns his hatred against the denying or 'bad' breast he attributes to the breast itself all his own active hatred against it". We may legitimately ask where are the facts on which this inference is based. What of the hosts of infants who have never known the maternal breast but are bottle-fed? Does the rubber nipple become to them the prototype of good and beneficence or of evil and persecution?, or does the statement that "in infancy the child sucks the breast into himself, chews it up and swallows it and feels that he has actually got it there" apply equally to his feeding-bottle? Quoted from a review by Dr. G. A. Auden in *The Brit. Jour. of Educ. Psych.*, Vol. VII (p. 321) of a book entitled *On the Bringing-up of Children*, edited by John Rickman.

¹ Op. cit., p. 117. These records are based on the regular observation of a group of over 100 infants as well as of supplementary groups.

² See Gesell and Ilg, op. cit., p. 121.

³ In *Introductory Lectures on Psycho-analysis*, p. 263. This is pointed out by Dr. Hadfield in 'The Concept of Sexuality', *Brit. Jour. of Med. Psych.*, Vol. V, 1925, p. 171.

and tied the right thumb in a woollen covering, there was crying and distress, but no tendency for the baby to console himself with the left thumb. Why not, if oral satisfaction of a sexual nature is the sole or main motive? Even granting that the mere sucking of the thumb, or breast, or other object, is itself a source of enjoyment owing to the sensitive nature of the mouth, the suggestion that it is a *sexual* experience seems gratuitous.¹

Another argument in support of the sexual nature of sucking the breast is that the satiated baby at the breast, as it sinks asleep 'utterly satisfied', bears a look of perfect content 'which will come back again later in life after the experience of the sexual orgasm'.²

My own impression is that, so far as he resembles anything other than a baby going to sleep with rather moist-looking lips, it is at times perhaps a bibulous person well oiled. Further, the sexual act may leave the expressions of both man and woman open-eyed and alert. But personally, unlike some of the psycho-analysts, I find generalization on this point difficult.

The significance of kissing and thumb-sucking. Freud does regard sex in infancy as comprising a number of relatively independent impulses or sensations, especially connected with the mouth and the genitals, which are only linked later into the complete sexual experience. But this linking and the much more intense sensations and emotions connected with mature and full sex-experience make quite a different thing of these supposed elements. The fact that in this mature experience kissing itself constitutes a further element of enjoyment is no evidence that kissing at all other times has some element of sex about it. It is not the same even when, at other times, a man kisses the same woman. (Otherwise as the Lincolnshire farmer said of the tortures of a material hell, 'No constitution could possibly stand it!') Why should there be any resemblance to sex-experience when an infant of 2 to 3 years kisses his or her mother.³ Indeed, the records I have already given of the kissing of B and Y (Chap. XVII p. 312) indicate how commonplace as to feeling kissing seemed to be, being used (often reluctantly), as a sign of good-bye or as a ritual carried through mechanically

¹ The constant placing of things in the mouth by young apes, and the chewing and playing with them, is worth considering in this connexion. Kellogg's ape could hardly 'go for many minutes without having something in her mouth to play with'. (See *The Ape and the Child*, p. 143.) Yet the mouth would hardly be considered an erotogenic centre for apes. Kellogg remarks that special activity in biting was associated with teething in his ape, as it was with his child.

² Freud, *Introductory Lectures, &c.*, p. 263.

³ The illogical nature of other items in the Freudian reasoning about sex was acutely criticized by McDougall in his book *Psycho-Analysis and Social Psychology* (London, 1936).

without the slightest sign of enjoyment. A note already quoted records that at 2;7 an elder brother often wanted to kiss the baby a few months old, but 'practically never' to kiss his mother or father.

One of Freud's arguments on the sexuality of thumb-sucking is that children in whom this habit is retained are 'habitual kissers as adults' and show a tendency to 'perverse kissing', or as men they have a marked desire for drinking and smoking.¹ No figures are given and Freud's statistical method is baffling. Presumably he reaches such a generalization from his notes on neurotics who come to him as patients. But how many men with a marked desire for drinking and smoking are *not* ex-thumb-suckers! And what are the limits of 'habitual kissing' and what proportion of thumb-suckers are such? And did Freud really think that the chief pleasure in drinking is a stimulation of the lips?

'As to women,' continues Freud, 'many of my female patients showing disturbances in eating have been energetic thumb-suckers during infancy.'

But of course if, say, 50% of infants are 'energetic thumb-suckers', which may very well be true, then a fair proportion of Freud's patients with 'disturbances in eating' would in any case be likely to be ex-thumb-suckers without it being connected with their particular ailment. Observations on 60 'Problem' children and 60 'Control' children in a nursery school (ages, with a few exceptions, 2;0 to 6;0) revealed that 26 of the Problem children and 28 of the Control children were still thumb-suckers.²

Charlotte Bühler's colleague E. Bergel, among 15 infants studied, found 11 reported as regular thumb-suckers, three of whom continued until 3;0 and one until 4;0.³ Dr. Isaacs states that thumb-sucking appears to develop more strongly in children when rage and intolerance of frustration are specially marked from the earliest days.⁴ So far as my few observations go this was not the case. The two who at night continued thumb-sucking for some time after early infancy were (i) A, who was noted as an exceptionally

¹ *Three Contributions to the Theory of Sex*, p. 44. My comments here on Freud's assertions are a paraphrase of my discussion of them in *The Difficult Child and the Problem of Discipline*, pp. 12 ff.

² See W. E. Blatz and J. D. M. Griffin, *An Evaluation of the Case Histories of a Group of Pre-school Children*, p. 10. (Univ. of Toronto Child Development Series, No. 6, 1936).

³ See Ch. Bühler, 'Zum Problem der Sexuellen Entwicklung' in *Zeit. f. Kinderheilkunde*, 51 Band, 1931, p. 623. Bühler also refers (p. 615) to figures given by Lindner in a report in 1879 in which the proportion is much lower—69 in 500 children. But the term Ludler may, in his case, have referred only to children who persisted in thumb-sucking even after the first two or three years and during the day as well as at night.

⁴ *Year Book of Education*, 1935 (p. 384), London.

placid baby, and (ii) Y, who was not only much less prone to rage impulses than B and X but continued so when infancy was passed.

But supposing Dr. Isaacs's generalization to be true, it might very well come about in this way, that those infants, who were intolerant of frustration, would tend to be given way to by their mothers and allowed to continue thumb-sucking at night as a means of pacifying them and getting them to sleep. In letters written by parents to Dr. Isaacs, when she was adviser by correspondence for a popular weekly journal, only 27 parents out of 572 wrote about thumb-sucking (children's ages 0; 11 to 7; 11). No doubt most parents treat thumb-sucking in the first year or two as trivial, as I have usually found parents and nurses do, some advocating it as a help in getting the infant to sleep. (The once popular, but dangerous comforter, was proof of that.) The children reported to Dr. Isaacs, however, were apparently serious and persistent thumb-suckers, all refractory to treatment by scolding, coaxing, punishment, bitter aloes, gloves, binding the hands, &c.¹

Erections and masturbation. Erections of the penis in the first year or two are also referred to by some Freudians as evidence of sex-experience in infancy. There is no doubt about these erections, but how frequent or how universal they are is uncertain. M. G. Blanton in her study of a 'very large number of infants' during the first 30 days of life in a maternity ward, noted four erections at birth and one at 4 days.²

Here, again, one cannot assume that such erections are accompanied by similar sensations to those of the adult. Indeed, it is possible even for the adult man, at least in late middle life, to have erections without any sex impulse or even pleasant sensations. On the other hand, it is possible that some characteristic sensation is already present in infancy. But these erections with rare exceptions seem to cease after the first few years. Their appearance and later disappearance till near puberty afford another example, like the walking reflex, of an early appearance, in a primitive and incomplete form, of an activity which reappears after an interval, as we have discussed in Chapter IV under the heading of 'Anticipatory Developments'.

Similarly, the mere fact of playing with the genitals in the first year or two may in most cases have no more significance than the infant's prolonged playing with its fingers or toes. The evidence of one or two observers, however, as to the facial expression, &c., during masturbation suggests that in a few cases at least there

¹ See 'Some Notes on the Incidence of Neurotic difficulties in young Children', *Brit. Jour. of Educ. Psych.*, Vol. II, 1932, p. 82.

² 'Behaviour of the Human Infant during the First Thirty Days of Life', *Psych. Rev.*, Vol. 24, 1917, p. 460.

is some excitement and pleasant localized sensation attached to this masturbation—which, with J. B. Watson, I should prefer at this early stage to call manipulation.

The experiencing during infancy of sensations in the genitals, may be of a somewhat similar kind to that during and after puberty, though I do not think their similarity has been proved. I am only sceptical as to (a) their intensity, (b) their frequency, and (c) their having any significance whatever for the attitude of the child towards parents or other adults.

As Dr. Hadfield has emphasized, there is a distinction between genital *sensations* and sex impulses.¹ After puberty, masturbation is no doubt very much commoner than used to be supposed.² Its frequency among very young children is uncertain. Even among children of school age (presumably 6 to 14) Professor Burt found it represented only 6.3% (boys) or 11.2% (girls) of the cases of neurotic symptoms in the children he subjected to a prolonged study.³ No doubt, however, it would be harder to discover than some of the other symptoms. Charlotte Bühler, referring to the differences of opinion on the frequency of masturbation in early childhood, quotes—against the opinions of the psycho-analyst, J. K. Freud, that it is a normal and everyday occurrence—the findings of C. Boenheim, the pediatrician, on the basis of a large number of observations in the Berlin Polyklinik, that it is a sign of prematurity and degeneracy.⁴

In a recent survey of a considerable German literature on sex and sex-development in childhood Charlotte Bühler finds evidence of masturbation in infancy rare and for the greater part open to criticism.⁵

Also the observations of H. Hetzer, whom she quotes, show that there is in some infants apparent masturbation, which is only play movement, of the type I have also indicated above. And two examples only are given among an unstated number of children observed of general masturbation (ages 1; 5 and 1; 4) concerning which Fraulein Hetzer wrote: 'Diese Bewegungen werden von uns für masturbatorische gehalten, wofür der Ausdruck von Versunkenheit und das Nichtspielerische, sondern Anngespannte des Verhaltens unsere Kriterien sind.'⁶ Dr. Bühler quotes further figures, amassed by C. Boenheim, of 1000 children dealt

¹ See The Conception of Sexuality, *Brit. Jour. of Med. Psych.*, V, 1925, p. 162.

² For evidence as to frequency, see Havelock Ellis, *The Psychology of Sex*, pp. 83 ff.

³ See *The Subnormal Mind*, p. 338 (London, 1935).

⁴ *From Birth to Maturity*, p. 64.

⁵ See 'Zum Problem der Sexuellen Entwicklung', *Zeit. für Kinderheilkunde*, 51 Band, 1931, p. 616.

⁶ *Op. cit.*, p. 617.

with in the Berlin Poliklinik. There were only 53 cases of masturbation. Incidentally the highest percentage for boys was for the period 7, 8 and 9 years—the supposed ‘latent period’—when it was about 1 in 15. But no doubt the slight manipulation of the earliest years would not be considered to need treatment. With girls it was about 1 in 9 for the years 4, 5 and 6, and 1 in 6 for years 1, 2 and 3.¹

Obviously much will depend on what is regarded as masturbation. In the mass observation of children, momentary playing with the genitals or a boy's readjustment of his genitals in uncomfortably tight trousers, or scratching due to tickling, is liable to be recorded as masturbation. Such may account for the higher figures given by certain observers of Nursery School children between the ages of 2; 0 and 5; 0. Of 283 boys, 34% were observed to masturbate; of 296 girls, 21%. Nothing is said as to what was judged to be masturbation.²

Even such a firm believer of the importance of sexual elements in infancy as Susan Isaacs, referring to masturbation says:

It is descriptively true that the great majority of children, who are not severely punished or terrified out of their wits by threats of the harm that will ensue from masturbation, do grow out of it as their normal interests and activities develop.³

Dr. Isaacs also agrees with Dr. K. B. Bridges that, as the children's interest in the activities provided in the school and their play with other children develop, the masturbation disappears—except for those children ‘too severely embroiled in internal conflict’.⁴

Under the special heading ‘Masturbation’ Dr. Isaacs only gives one example observed in the three years at her Malting House School, when X ‘appeared to be masturbating at frequent intervals, standing about in a vacant dreamy way’.⁵ There are, however, two or three examples of masturbation given under Sexual Play and Aggression and provided by Dan (age about 4; 0). Even in the great freedom of the Malting House School, however, such practice was gently discouraged.

Some further evidence is given by the questions put in letters from parents to Dr. Isaacs already referred to. Out of 572 children about whom parents wrote for advice only 26 were reported as masturbating—

¹ Op. cit., pp. 625–6. The greatest number among the 23 cases of masturbation among boys reported at a Geneva Clinic were found at 12; 0 (7 cases), and at 8; 0 (6 cases) but these were also the peak ages for all the 104 boys dealt with. See *Les Enfants Difficiles et leur Milieu Familial* by M. Loosli-Usteri (Neuchatel), pp. 221 and 223.

² L. A. Hatwick, ‘Sex Differences in Behaviour of Nursery School Children’, *Child Development*, Vol. 8, 1937, p. 347.

³ *Social Development in Young Children*, p. 346.

⁴ Op. cit., p. 349.

⁵ Op. cit., p. 147.

11 boys and 15 girls (between the age ranges of 8 months and 7 years). This contrasts with 59 cases of excessive fears, 41 of uncleanliness, 69 difficult in relation to authority, 27 cases of thumb-sucking, and so on.

Of course this gives no definite proof of the proportion in the population; these were *selected* difficult children. On the other hand, there may have been acts of manipulation which these parents had missed; or occasional playing with the genitals considered merely as play, as I have suggested above. But it does suggest that even among difficult 'problem' children masturbation is not frequently a serious trouble in the early years. Parents would be much more likely to be perturbed by masturbation than by thumb-sucking, about which practically the same number wrote.

The castration complex. The little boy's discovery that a girl has no penis is said by psycho-analysts to lead to a fear of his being deprived of his own, while little girls on making the corresponding discovery are said to become envious.¹ That some boys may be threatened by stupid parents with castration at a later age when practising masturbation may be admitted, but for the statement that '*many* children are threatened with castration or an equivalent disease' made by Dr. Isaacs,² no direct evidence is offered, except that an adult patient of hers reported that he was so threatened by his father when he was 14. Against a general assertion like that of Dr. Isaacs may be set the statement of Dr. R. G. Gordon that evidence for the fear of castration is 'entirely absent in his own experience'.³ The material given by Dr. Isaacs in her book under the heading 'Castration Fears, Threats and Symbolism'⁴ as evidence of such fears, seems to me most unconvincing.

I give one sample of the symbolism. 'In the afternoon Dan and Frank played in the sand-pit. They took off their shoes and stockings and dug their feet in, so that these could not be seen. Dan called out to Mrs. I, "Tell Priscilla to ask us to come and love her." Mrs. I did so. His reply was, with much laughter, "We can't because our legs are cut off."'

Of course the idea of legless or footless little boys (as they would appear) hobbling towards Priscilla would appear funny to the children. Why should legs be regarded as *symbols* in such an otherwise comprehensible joke?⁵

Again: 'Penelope and Tommy were playing "mummie and daddy" and Tommy insisted on being the mummie' (p. 166).

¹ Freud, *Introductory Lectures*, p. 267.

² *Social Development*, &c., p. 355.

³ *The Neurotic Personality*, p. 81.

⁴ *Op. cit.*, pp. 163 ff.

⁵ Professor Burt asks further, 'Would any child at this age, however subtle, assume that either Priscilla, or for that matter Dr. Isaacs, realized the covert symbolism?'

What bearing has this on the fear of castration? The wish of Tommy (3; 8) to play the part of mother is perfectly understandable, even if he has no knowledge whatever of sex differences, or is willing to ignore them for the moment. Anyhow, why should it help a fear of castration? To suggest that some such explanation is necessary seems to show a surprising lack of understanding of a child's love of imaginative play of any and every kind.

The most delicious example of such explanation is perhaps that reference to J. G. (2; 7), on p. 462, which I have already quoted in the chapter on Play (p. 166).

Sex in female Infants. Freud's views as to the little girl's ideas of her deprivation of a penis are given in his articles on Female Sexuality.¹ From this one might imagine (i) that a feeling of inferiority is necessarily felt by every little girl when she discovers that boys have something she has not; (ii) that she regards her mother as responsible for this and so arises the strongest motive for turning away from her; (iii) that she 'clings obstinately to the expectation of acquiring a similar organ sometime'; and (iv) that when a new baby is born 'the little girl like the boy wants to believe that she has given her mother this new child'.

No evidence is put forward for such statements. The reader is left with a vague impression that these generalizations are supposed to be proved by the reports of patients; but how much is fact and how much inference and surmise is left entirely uncertain. Yet although Freud in one place asserts that 'a description which fits every case is in fact almost impossible' (p. 288), he does not hesitate to make sweeping generalizations. For example, on the same page he says, 'Invariably the child regards castration in the first instance as a misfortune to herself.' Then subtle explanations of the screaming of little girls when given enemas by their mothers are given, such 'fury' being compared to the orgasm following on genital excitation, and 'the accompanying anxiety' being construed as a transformation of the desire for aggression which had been stirred up (p. 292). The probability of an enema hurting if given by an unskilled hand (as one of my own infants of 9 years complained) is not mentioned!

Further types of evidence of sex examined. Later in this article Freud criticizes Melanie Klein for attempting to place the beginning of the Oedipus complex as early as the beginning of the second year, which Freud says is 'not in accordance with what we learn from the analysis of adults and does not allow for the long pre-Oedipal attachment to the mother'. In these latter points Freud clearly in his later years bowed to facts of the development of normal children. Melanie Klein, however, seems content to base her view

¹ *International Journal of Psycho-Analysis*, XIII, 1932.

largely on her interpretation of the play and other activities of children she analysed. The first criticism of this of course would be that the children brought to her for treatment would usually be, and indeed seem to have been, very difficult and abnormal children. But she is not perturbed by this. Her sense of evidence is indicated by the following statement :

These are but few examples of the abundant variety of sexual phantasies which are to be found in *every normal child*—a point which I wish particularly to emphasize. I can assert this, as I have been lucky enough to have several normal children for analysis from the prophylactic point of view.¹

So the study of '*several*' normal children (how proved normal is not stated) is enough to make and emphasize a generalization about '*every normal child*'! Mrs. Klein defends herself against the charge of giving accounts of abnormal children as evidence about normals, by replying naïvely that 'The same material is to be found in normal children too' (p. 185). Then why does she not describe the normal child instead?

Her sense of evidence and the naïveté of some of her inferences may be further illustrated by references to two cases :

(1) She states that the boy Peter (3 ; 9) (who was sent for analysis, chiefly as a prophylactic measure, but who was discovered by M. Klein to be suffering from a serious neurosis) was analysed for 278 sessions, after which there was an 'extensive change for the better in his whole character : for example, he had begun to get on well with other children, in particular with his little brother'. But as this period of analysis presumably covered at least the greater part of a year, such an improvement might well have taken place first by mere maturing, or by having frequent periods of play in a sympathetic atmosphere away from his home. Such improvements can often be noted of new entrants in nursery schools. 'I have myself had reports by my own daughter on several children who after a short period of a few months in the nursery school with no special treatment, were reported as greatly improved at home. More extensive evidence of improvement in character through co-operative play is also afforded by Dr. K. Bridges' reports on her nursery school children when there was no analysis.'²

Dr. Isaacs's own records of the Malting House School afford similar evidence of the possibility of great improvement without

¹ Article on 'Criminal Tendencies in Normal Children', *Brit. Jour. of Med. Psych.*, Vol. VII, 1927, p. 183.

² *Op. cit.*, Ch. VII. I have touched on this question of improvement due to mere maturation or a change of environment in Chap. I, pp. 16, 17, and in my little book, *The Difficult Child, and the Problem of Discipline*, Chap. IV.

analysis. Thus having recorded that Miss Bridges found, too, that the first bullying impulses of the older and bigger child to the younger and smaller usually change into a protective care, under the influence and example of the grown-ups, she adds, 'This is the normal course of events.'¹ Later she adds that the child's first 'hostile impulses' tend to be 'transformed into' friendly co-operation by experience among his fellows. By 'actual experience with loving parents or a wise teacher' 'he discovers that the grown-ups do still in reality love and cherish him'.² Where in the home there was lacking sympathetic and understanding treatment of the child, the mere change to the free play and friendly atmosphere and pleasant treatment of Mrs. Klein's home no doubt might effect much.

(2) The naïveté of some of Melanie Klein's inferences may be further illustrated by a paragraph on the treatment of the little girl Trude, age 3 ; 9, who was 'very neurotic'.

She came into my room full of anxiety and ill-will, and I was obliged to analyse her in a low voice with the door open. But soon she had given me an idea of the nature of her complexes. She insisted upon the flowers in a vase being removed ; she threw a little toy man out of a cart into which she had previously put him and heaped abuse on him ; she wanted a certain man with a high hat that figured in a picture-book she had brought with her to be taken out of it ; and she declared that the cushions in the room had been thrown in disorder by a dog. My immediate interpretation of these utterances in the sense that she desired to do away with her father's penis, because it was playing havoc with her mother (as represented by the vase, the cart, the picture-book and the cushion) at once diminished her anxiety and she left me in a much more friendly mood than she had come, and said at home that she would like to come back to me.³

Of course ! Could any fairy story be more diverting to a little girl ? No wonder she asked for more ! Why suppose that the soundness of the interpretation is necessary to explain the change ?

Some of Dr. Isaacs's own interpretations at times seem equally gratuitous. Thus of Ursula she writes : 'Later her sexual wishes towards her father are more openly expressed : "I think I should like to marry Daddy. Well, I'll see" : as though little children did not play at and imagine all sorts of relationships with all sorts of people. Again, when Ursula expresses jealousy of her mother it

¹ Op. cit., p. 235.

² Op. cit., p. 236. In her article in *Le Journal de Psychologie* (Vol. 28, p. 373) Dr. Isaacs puts this even more emphatically : 'A la fin de l'année, les journées étaient toutes occupées par une libre activité constante dans une atmosphère d'amitié et d'entente complète.'

³ *The Psycho-Analysis of Children*, p. 47.

is interpreted by Dr. Isaacs as *real* jealousy : but when she expresses her love it is "over-compensation for hatred and resentment".

One further matter must be mentioned to which the psychoanalysts attach considerable importance—namely, the supposed sexual significance of *obstinacy about defaecation*. The connecting links of the argument for this again seem exceedingly flimsy. First, such obstinacy seems sufficiently explicable by mere boredom at sitting doing nothing, or giving up some jolly play, or being taken out of a warm bed in order to be sat on a cold chamber. Indeed, if there is some emotional upset because of these things, a genuine inhibition of defaecation may surely arise, as it does in adults. Much of the difficulty too may be due to the plain fact that whereas an adult can be guided by his own sensations and inclinations, the mother sometimes tries to force the child at times which suit her own convenience. In view of this, the usual 'training' and regularity of infants by the age of 2 ; 0 or 3 ; 0 seems the wonderful thing, rather than occasional obstinacy.

In the small percentage of cases in which an infant of, say, 2 or 3 seems to be perpetually defiant towards parents and others it is conceivable that such early constraints should have first called forth defiance. But it is significant that the defiance, whether occasional or frequent, appears more decidedly at a later period when adult control as to defaecation is lessened. Its appearance at this later stage is more comprehensible, it seems to me, as another example of fuller maturation, this time of the self-assertive impulse. My own children showed much more resistance in connexion with other things—e.g. food and sleep. Thus

B, 0 ; 10. Yelled when put to bed to-night and finally fell asleep still sitting up. He was really very tired but seems to fight against sleep sometimes. So again next day he was found asleep fallen forward on his face.

The *sadistic* element is said by Freud to be the other most prominent feature in this early infantile period—'The impulse to mastery, which easily passes over into cruelty'.¹ But if, as we have seen reason to believe, there is a relatively independent impulse of aggression or pugnacity, an extreme form of this may well appear to take the form of cruelty for its own sake with no sexual significance whatever. We may recall that this impulse is so lively sometimes in apparently normal children that there is mere play at pugnacity and aggression. An outlet is found without any external stimulus.

We may now turn to the answers to my questionnaire which bear on the question of sexuality and especially of sex interests in infancy.

¹ *Introductory Lectures, &c.*, p. 275.

Questionnaire

Questions 5, 6, and 8. Question 7 has been dealt with under Jealousy in the last chapter.

Qn. 5. What signs were there, if any, of special sex-interest of a boy towards the mother or a girl towards the father, or of a child towards a parent of same sex: (a) during infancy, (b) during childhood (5 to 12 or 13), (c) during adolescence?

Qn. 6. Is anything under question 5 (especially 5(a) or 5(b), such as could be explained by a general tendency to be curious about the unknown or forbidden?

Qn. 8. Can you add any relevant observations not covered by the above questions, e.g. the earliest signs of sex interest or feeling of child as regards (a) himself, (b) sisters and brothers, (c) others?

It will be best to take each report separately first, and then sum up. The few answers about adolescents are given for the sake of completeness.

Family I. (Three boys and two girls—youngest now 10; 0)¹

Qn. 5. (a) A, B and C. Faint memories of curiosities—about father at least as much as about mother. W—nothing to report. X at 3½. Curious to see mother's breast.

(b) C at 8½ wanted to see M 'in bare skin'.

(c) Way in which A kisses his mother seemed different at about 17 to 18.

Qn. 6. 5(a) All entirely understandable as mere curiosity about matters we kept secret. 5(b) C's might be mere curiosity, but he tells his mother he keeps thinking about people 'in their bare skin'.

Qn. 8. A and B showed only slight natural interest in difference noticed in baby sister whom they were allowed to see bathed when aged 4½ and 2½. W, when 5; 0 to 7; 0 showed similar mild interest in baby brother.

Family II. (Two boys and three girls: all reached adolescence)

Qn. 5. (a) None. (b) None. (c) None.

Qn. 6. Nothing under 5 to explain.

Qn. 8. Nothing been observed by parents.

(N.B.—This report is by a psychologist (not the present author) who has published some studies of the infancy of two of his children.)

Family III. (Three boys—youngest 10; 0)

Qn. 5. (a) None recalled beyond signs of desire for the warmth and comfort of mother, e.g. C aged 3 years 2 months, said when he learned that his father would be away for a week, 'I shall be unhappy (pause) . . . but I shall be able to sleep in his place beside you.'

¹ In this section, dealing with Questions 5, 6 and 8 of the questionnaire, the number of all the children in each family is given, though some of them, being under 3; 0, were not included in the consideration of the earlier questions.

(b) None.

(c) Slightly more solicitude for the mother's well-being than for the father's—but no sign that this was due to anything but the realization that the mother was more easily upset than the father. This was particularly noticeable in the case of the two older boys during the last few months before the birth of the youngest.

Qn. 6. From infancy sex matters were treated simply and naturally. No special curiosities are recalled and no topics were forbidden.

Qn. 8. (a) Interested in origin of things at an early age (3-4), but this may have been due to stimulation of interest by parents.

(b) Not specially interested in the members of other sex—rather contemptuous of them from earliest years.

Family IV. (Two boys, 9; 0 and 7; 0)

Qn. 5. (a) None.

(b) No information has been withheld from either child when asked for. The inquiries of the children have dealt with birth only, not with any difference between the sexes.

Qn. 8. Neither child has expressed appreciable interest in questions of sex.

Family V. (One boy. Reached adolescence)

Qn. 5. (a), (b) and (c) None that I can see.

Qn. 6. There was not in his case anything unknown or forbidden.

Qn. 8. He has never shown any different attitude to sex from other things. Learnt naturally in country about birth of dogs and horses and asked casually when about 6 if we were born the same way. Reads omnivorously, including Encyclopaedia and biology books about the house, and undoubtedly knows all about the sex apparatus in plants and animals.

Family VI. (Two girls, now 10; 0 and 3; 0: the details below, however, on Qns. 5 and 6, were written when W was only 3; 9)

Qn. 5. (a) W, age 3; 9, on more than one occasion came into our bed at about 8 a.m., told me to get up and pushed me out so that she could be next to her father.

Qn. 6. W at 3; 9 has shown no curiosity as yet about sex.

Qn. 8. When her baby sister was born, W saw the doctor's car and said she supposed he had brought the baby. She was not undeceived and has never asked since.

Family VII. (One boy and two girls: the younger girl aged 8; 0; the others have reached adolescence)

Qn. 5. (a) Nil. (b) Nil. (c) Nil.

Qn. 6. So far as we know there is nothing unknown or forbidden. The children have always been used to strip and bath together, watch the cat having kittens together, &c., and to see parents stripped.

Qn. 8. We undoubtedly see no signs of any Oedipus complex.

Family VIII. (Two boys, 6;0 and 3;0)

Qn. 5. (a), (b) and (c), none observed.

Qn. 6 and Qn. 8. No reports.

Family IX. (One girl, adolescent)

Qn. 5. (a), (b) and (c), none noticeable.

Qn. 6. No.

Qn. 8. The girl has an affection for her parents apparently fairly equally divided between them.

Family X. (One boy, adolescent, and one girl aged 6;0)

Qn. 5. (a) None. (b) None until now in either case.

Qn. 8. The usual questions were asked by both the boy and girl during infancy as to the various functions of the different parts of the body. These were apparently just the results of exploration and at no time has any more attention been given to sex organs than to any other parts of the body.

Family XI. (Two girls 7;0 and 5;0)

Qn. 5. (a) None.

(b) Both children tremendously proud of Daddy. W at 7;6 said, 'I wish Daddy were only *my* Daddy, not X's as well.' Why? 'Because B. B. said her big brother said my Daddy was the nicest teacher in the school and I wanted him only to belong to me.' Both children have wished to marry Daddy later on. X wept bitterly when W told her he would be too old! X had repeated it in imitation of W. W frequently observes that she has the best Daddy in the world and W once thanked Mummy for providing such a nice Daddy for them!

Neither child has to my knowledge shown any marked curiosity as to physical differences.

Qn. 8. Both children prefer to play with girls now, though W, aged 7½, seems more conscious of her preference. X has only quite recently arrived at this stage, for during her 5th year she generally played with boys at school. X's sex interest entirely hinges on her intense wish to grow up to be a mummy. She desired to marry Daddy, but when W told her this would be impossible she evidently gave some thought to a future possible husband, for one day she asked, 'Mummy, when I am twenty, how old will A. J. be?' I said, 'Twenty-one.' X asked would that be old enough to be a Daddy? On another occasion she said, 'D. B. is a naughty boy. He took a pear A. J. wanted. So A told me not to marry D.' I asked, 'Oh, what did you say?' 'I didn't say anything, but I shall do as A. J. tells me.'

Another day (at 5;7) she said, 'Mummy, did you or Daddy think of marrying first?' I think she wanted to find out whether, when the time comes, she will be expected to take the initiative. A week ago X (5;8) asked, 'How does the egg get out of the chickie's mouth?' Mummy explained something of the physiology of the hen and concluded by saying that X and W and M were made the same way. X added 'And Daddy.' W (7;6) laughed and said of course Daddy was different; he couldn't have babies.

Family XII. (Three boys, 5 ; 0, 2 ; 0, and 1 ; 0)

Qn. 5. (a) None noticed.

(b) On arrival of C, or a little later, A asked and was told by M where C came from. He said, 'Have you any more little babies inside you? Why wasn't it inside me?'

Qn. 6. No, obviously not. A has seen F and M in a state of nature. M quite frequently, in joint use of bathroom for morning cold baths in summer. A was interested in M's axillary hair and asked about it.

Qn. 8. We have not yet observed any signs which could be ascribed to sex interest. The absence of sisters does not altogether account for this in the past because we have had little girl visitors, and two years ago A played in a pool in the garden with a little boy and girl of his own age naked.

Family XIII. (Boy 8 ; 0, girl 3 ; 0)

Qn. 5. (a) About age 4-6 A asked questions relating to birth and sex fully explained by question 6. Parents satisfied his curiosity fully and simply. W not yet awakened at all.

Family XIV. (Two boys, 7 ; 0 and 2 ; 8 ; one girl 4 ; 0)

Qn. 5. (a) None noticed. Each infant was breast fed, and showed great enjoyment of the process by various plays, e.g. handling the breast, withdrawing from it and then seizing it again with growling noises. Periods of vigorous kicking when at the breast.

(b) Great interest shown by A in M's anatomy at period of W's gestation and birth and nursing of W. Imitated in play. He was often seen suckling his Teddy bear.

Qn. 6. By the unknown, yes ; by the forbidden, no.

Questions asked by A and W about their own and parents' bodies in a spirit of general curiosity.

Qn. 8. Each child has shown enjoyment of masturbation in infancy and later. This seems to occur in periods and has not been a regular habit.

Family XV. (One girl 3 ; 8, one boy 1 ; 6)

Qn. 5. (a) From 5 months on A has shown pleasure when his mother ties on a napkin or otherwise manipulates panties, &c. A presses his legs together, on M's hand, with evident enjoyment.¹ A's mild stimulation in the above connexion is shown more towards M than F.

W has shown equal interest in the genitals of both parents. From one year on she has never shown the same vivid erotogenic reactions that her brother displays. Her life is on a more cognitive level.

Qn. 6. As to A, no. As to W, the matter is more subtle. The parents have tried to be reasonably free with both children, but without unduly stimulating the children along sexual lines. Both children frequently see either parent in the bath, and they show no persistent

¹ As we saw in Chapter VI, spontaneous movements and kicking are constantly taking place at this age, and exposure to the air and then the friction of a cool napkin would be apt to stimulate such kickings.

interest in the genitals of either parent. W has often asked questions about genitals, and has sometimes commented favourably upon F's, or somewhat shyly joked about it. For the past two months, however, W has been asking long chains of what seem to be causative-connected questions, such as: What made the man cry? (He'd lost his money.) Why did he lose his money? (He had a hole in his pocket.) Why had he a hole in his pocket? (Well, it just tore.) Why? . . . &c. . . . &c. These chains of questions are continued for as many as ten or more 'why's?', and are about anything, physical, psychological, fact or fancy. A few days ago we all travelled for seven hours in a train, and we were inundated with these questions, about factories, &c. After several hours she asked, having learnt that knives, plates, tables, &c., were made in factories: Where are people made? I believe W is showing somewhat furtive interest in matters pertaining to sexual activity: but we cannot be sure.¹ If the surmise is correct, then W is having this interest whilst displaying more or less equal interest towards her parents in sex matters.

There is little doubt, however, about this: W's behaviour up to recently could scarcely be explained as due to an interest in the forbidden. But there is obviously something puzzling her at present (for the past two to three months) connected with the growth and beginning of children. She cannot understand, for instance, why she was not there when F and M were children—the question is raised by herself—and W displays emotion if the answer is other than to the effect that she *was* there. The emotion, controlled and held in, could easily, one imagines, lead to crying.

I am of opinion, then (rather, we both are), that W is bothered by something unknown or incomprehensible to her. This trouble, however, has no counterpart in a specific interest in one or other parent.

Qn. 8. (a) 3;0. W sometimes plays with her genitals; wants to stick a pencil, &c., in, attempting this when we are with her—presumably something of the same kind will occur when we are not with her. This began at approx. 1½ years;² at the same time questions of the kind as follows were freely asked: Has a seagull got a 'tickly'? Has a motor-car? Has Dr. X. got a 'tickly'? &c.

A has shown no pronounced interest as regards his own penis, up to now (1½ years).

(b) A mild interest in A is shown by W. 'A has a tickly like John' (2 years). But the fact that W is very jealous of A militates against any overt sex interest by W in A.

¹ This seems to be an example of the misinterpretation of the question about how people are made, of the type already discussed in the first pages of this chapter. Perhaps I should report that this parent was an exception to my rule that I should not ask reports from parents who were strongly Freudian or anti-Freudian. I only found out later that this parent had marked Freudian views.

² The idea of a little girl of 1;6 trying to 'stick a pencil in' is extraordinary. Surely it would be very painful so far as successful. Was not mere 'playing about' misinterpreted?

A has shown interest in W, especially when W has been on the stool. Has tried to look at W urinating.

(c) W has asked whether certain men have 'tickly's' like daddy's. (From approx. 2 years. She *now*, at 3 ; 8, seems to tacitly accept that men have genitals like daddy, and women, like mummy and herself.)

A has shown no interest as to others.

Family XVI. (One girl of 7 ; 0, one boy of 3 ; 0)

Qn. 5. (a) A for some time about the age of 3 ; 0 made persistent efforts to feel M's breasts. At 3 ; 4 A asked questions *re* difference in anatomy between M and himself. (Latter may have been *only* curiosity.) W at about 2 ; 6 very interested in sex differences between self and F.

(b) None noticed.

Qn. 6. So far as curiosity goes, yes. When curiosity had been satisfied the interest appeared to decline. Questions about sex difference, childbearing, &c., have not been treated as forbidden subjects, questions have been answered in a normal manner within the degree of understanding, &c., of the child.

Qn. 8. (b) W showed interest in A's anatomy when she first saw him. W then 4 ; 4. Also in facts of birth and childbearing. Both children have seen each parent dressing and undressing, in bath, &c. This policy has been pursued from the first so that neither parents nor children feel embarrassment.

Family XVII. (Boy 6 ; 0, girl 3 ; 0)

Qn. 5. In any ordinary sense of the term 'sex interest' I should say definitely 'none'. I have been surprised by this. On general theoretical grounds I am impressed by the Freudian case for 'infantile sexuality', and have observed with these views in mind, but my observations have given quite negative results. This may be explained by the fact that in sex matters the children have been brought up in the 'modern' manner. They have been accustomed to seeing us in and out of the bathroom during our ablutions. They have been acquainted with the physical difference between the sexes since they have been acquainted with anything, and their questions about sex have been answered as they arose. They have shown the ordinary, natural curiosity about the sex-organ act, and their own origin, but their interest in this has not exceeded their interest in other matters, physiological and biological.

Summary and discussion of answers to questions on Sex in Questionnaire, Answers 5, 6 and 8. A statistical summary of the answers to these questions might be misleading because no doubt different reporters took different standards and some would be more acute or more suspicious observers than others.

If we consider masturbation, for example : this is only reported, even in elementary form of thigh-rubbing, by numbers I, XIV and XV. It is possible that others may have failed to observe such playing with the genitals as I have described above, or have interpreted it as not genuinely sexual. I do not think it important

for my general discussion : I have agreed that many, quite possibly most, infants get some agreeable sensation in such play. What is, however, significant is that no one of these forty-two infants is reported as having masturbated to any extent to cause any unusual facial expression or so to suggest any intense feeling, except in family XIV, child B, of whom at about 2 ; 0, when having trouble with teething, his mother reported she could always tell when it was happening because it was accompanied by a curious gargling noise. 'He has lost the habit since about 2 ; 3. The habit still recurs with A (7 ; 0) when he is excited and seems to be almost a nervous mannerism.'

The reports on these forty-two infants then agree with the evidence we have considered in indicating that, as a general rule, masturbation, when practised at all, is only trivial play accompanied perhaps by a mildly pleasant sensation and from which the child is easily deviated without any conflict or annoyance.

As regards the marked example of masturbation by a little girl, that of W in Chapter XV, in which she was thought to try to put a pencil into the urethra (at the extraordinarily early age of 1 ; 6 to 3 ; 0), if this was not mere aimless play with the pencil, as I have suggested above, it is worth remarking that it was done openly in the presence of the parents ; there was nothing of shame or guilt about it. In only two or three cases was there a necessity of checking any signs of sex impulses, masturbation and the like. Such at least would surely have been remembered if it had been anything more than occasional and very mild checking. Yet the checking of such impulses by parents is supposed to be the main factor in causing shame, guilt and repression resulting in the 'latency period'. I imagine most parents know how difficult some other inconvenient habits are to repress. In view of the usual persistence of infants of 2 or 3 in matters where their desires are intense, we may infer that such mild restraint can only have checked very mild impulses. If in some cases these impulses are more than mild, and if they really do cease during a latency period of 6 or 8 years to puberty, they may be a further example similar to the walking reflex or one or two others we have met, in which an activity appears at a very early stage in a crude and ineffective form and then disappears until it reappears in a very different and more effective way. Malinowski's observation on the Trobriands may seem to constitute a difficulty here. He found sexual play taking place in pre-pubertal childhood. The children playing husband and wife and pretending to assume all the functions, including intercourse. It is not clear, however, how far such plays are due to the imitation of older children and how far they are a source of sexual pleasure. Malinowski states that 'the children initiate each other into the

mysteries of sexual life'.¹ He estimates the beginning of 'real sexual life' at 6 to 8 in the case of girls and 10 to 12 for boys.

But it is significant that Malinowski refers to puberty as giving the 'newly awakened sex impulse'.² The truth seems to be probably this: that any sexual sensations and impulses are only of a very mild kind in the great majority from early infancy at least until a year or two before puberty, but can be kept alive and stimulated by the influence and suggestion of others, sufficiently at least to form a game for such savages and an exciting form of secret and forbidden game for the children of more civilized people.

In concluding this chapter I should like to make two general remarks. First, the refuting of assertions as to the importance of sexual elements in early childhood would not invalidate the fundamental importance of repression as expounded by Freud: indeed, even such severe critics of the doctrine of the Oedipus complex as McDougall, Hadfield and other medical psychologists retain a strong belief in the significance of repression and the value of psycho-analytic treatment.

As to the power of sex, experiences during adolescence and succeeding periods are surely sufficiently convincing; whether the ideas of infantile sexuality reported by patients are indeed (a) suggested by psycho-analysts—as Freud at one time himself suspected—or (b) are entirely or partly the patients' own interpretations of and exaggerations of relatively slight sensations and impulses, or (c) whether they are largely true but only in a few abnormal cases, this is not the place to discuss. But the fact that the reports of patients, which Freud himself took at first to be facts, proved to be mere fantasies is very significant.

My second and final general comment refers to the frequent suggestion made by psycho-analysts that those who do not believe in the Oedipus complex and the supreme importance of sex in infancy are deliberately refusing to accept the truth. Freud, for example, in his *Autobiographical Study* (p. 96) refers to Jung as trying to give to the facts of analysis fresh interpretation; and thus 'he hoped to escape the need for recognizing the importance of infant sexuality and of the Oedipus complex'. Dr. J. Glover has a fling at those to whom sexuality in infancy is 'incredible and emotionally unpalatable'.³

¹ *The Sexual Life of Savages*, p. 47 (London, 1929).

² *Sex and Repression in Savage Society*, p. 62. Malinowski in any case is of little use to the psycho-analysts as a witness. He will have nothing to do with the Oedipus complex and now regards his own earlier statement that 'a young organism reacts sexually to close bodily contact with the mother' as absurd (op. cit., p. 36).

³ See 'The Conception of Sexuality' (*Brit. Jour. of Med. Psy.*), Vol. V, 1925, p. 188.

It is difficult to see how Dr. Glover expects the ordinary psychologist to be convinced merely because he says that 'unlike the evidential data of other scientific hypotheses the evidential data of psycho-analysis are for obvious reasons accessible only to a few workers'.¹ Apparently therefore we are expected to take the interpretation of the psycho-analysts themselves. But accepting the results they report, the validity of the method may be questioned, as I have already indicated. However that may be, the reply that I want to make at the moment to this accusation of prejudice and refusal to accept an unpalatable truth, is that the medical psychologist who believes in the influence of the unconscious should surely be chary of using such an argument against others. It might be replied, as indeed it has been, that once having surmised the truth of the Oedipus complex, Freud and his followers had to continue to assert it in the face of strongly conflicting evidence because of an unconscious desire to retain their own prestige. It might even be suggested that medical psycho-analysts who secure fee-paying patients for a hundred or two visits not unnaturally wish to retain their own belief and the belief of others in the truth of their views and the value of their therapeutic measures. I am not suggesting that this is the cause of their beliefs. I do not myself believe that it is, at least usually or mainly. I wish to point out that for the believers in the Oedipus complex to accuse critics of blind prejudice and unconscious or unworthy motives is an example of people who live in very thin glass houses providing their opponents with very large stones. They have also supplied the technical term for it—'projection'.

Since I wrote the above Dr. I. D. Suttie has actually suggested that Freud sticks to his Oedipus complex because of a grudge against mothers and a 'mind blindness' to love.² And Freud himself, I find, anticipates that women analysts will attribute certain of his views to a 'masculinity complex'; but that it might be reported that it is quite comprehensible that members of the female sex should refuse to accept a motive that appears to gainsay their coveted equality with men. 'The polemical run of analysis', he adds, 'obviously leads to no decision.'³

¹ See 'The Conception of Sexuality' (*Brit. Jour. of Med. Psy.*), Vol. V, 1925, p. 196.

² *The Origins of Love and Hate*, p. 223.

³ Article on Female Sexuality, p. 285.

CHAPTER XIX

Learning and Remembering

Association, recognition, and recall in the first year. In the chapter on 'The New-born Infant' we saw that the first association made by B seemed to be between the anticipation of food and the feeding position; this was observed before the end of the first month. By the end of the 3rd month B began to recognize the mother's face.

Any association of sound with its visual direction as was shown at 3 months by B (and by A at the same period, as similar but shorter tests revealed) was of an elementary nature. Indeed, we cannot prove that it was not an innate connexion which had only matured at that time. Meanwhile, however, sight had been learning to deal with much more complex objects. The recognition of the mother's face at about 0; 3, with the implied discrimination between it and the faces of other persons,¹ and the earlier discrimination between a smiling and a frowning or simply placid face, involved some fineness of discrimination.

Before the 6th month various associations can be readily set up through sight. Thus at 0; 5 after our occasional use of a spoon for giving B water to sip, B opened his mouth at the sight of the spoon and so with a glass after it had been used about two weeks, once or twice a day. Darwin's child at 0; 5 seemed to realize the special significance of the putting on of his own hat and coat,² and Tiedemann's son at 0; 5 rejoiced when his own hat and coat were put on.³ Mrs. Moore says that the association between the sight of her own hat and the idea of going out was set up in her child's mind in 10 days at 0; 5½.⁴

Such associations are easier to prove than the simpler process of recognition of a person. For the reception with a merry smile of a father not seen for a few weeks, might only be a friendly response to a smiling face. Mrs. Moore thought her child of 0; 6 recognized her grandfather even after an absence of two weeks.⁵

I was sure I was recognized by my children at the age of about 0; 6. Indeed, my wife and I both thought it occurred at 0; 3,

¹ Evidence for this has already been discussed in Chapter XVII, pp. 310, 311.

² *Mind*, Vol. II, p. 290.

³ 'Tiedemann's Observations on the Development of the Mental Faculties of Children', by C. Murchison and S. Langer, *Pedagogical Seminary*, XXXIV, 1927, p. 217.

⁴ *The Mental Development of a Child*, *Psych. Rev. Mon. Sup.*, 1896, p. 100.

⁵ *Ibid.*

but it is hard to give proof. At 0;3 B looked at me solemnly when I had a hat on but smiled broadly when I took it off.

A note at 0;7½ seems to leave little doubt.

B, 0;7½. M thinks B recognized me as I was approaching (reading a paper) in the street without seeing them. His face, she said, lit up with an eager smile and he began to whisper 'Da-Da'.

The use of the name indeed now begins to be the best proof of recognition, even if, as we shall see in the chapter on Language, it may be primarily an expression of feeling.

Before leaving the period up to 6 months, I may add that it is possible—and I think quite likely—that at least one sound had become significant during this period, namely, that of the mother's voice. But it was exceedingly difficult to be sure of this. Mrs. Moore thought that her child at 0;4½ recognized her mother's voice, but does not give the evidence.¹

A new association began to appear in the 7th month; B's own pet name 'Baba' apparently gaining special significance for him. Thus on d. 211 and d. 212 he 'laughed when I spoke the word "Baba"', but not at several other words among which it was placed, and M reports he now says "Dada" more frequently when I am present than when I am not'. By the end of the 8th month this association was certainly established, and signs of other word-sound associations begin to appear. Darwin reports that his child at 0;7, when the nurse's name was mentioned, would look round for her.² Other learning of the meaning of sounds will be discussed more appropriately in the chapter on Language.

In some examples of supposed recognition of a face or a voice, we have to bear in mind the possibility of a response due to the summation of several stimuli, where one would not suffice. A good example of this is found in an experiment by J. M. Baldwin.

His child of 0;6½ had had the same nurse for 5 months. Then the nurse was away 3 weeks. On her return she first appeared without speaking (by Baldwin's instruction). The result was a questioning look on the baby's face, no positive sign of recognition, yet no sign of fear of a stranger. Then again the nurse withdrew out of sight and spoke; no sign of recognition. Finally she appeared and sang a nursery rhyme, which by special care the child had not been allowed to hear during the nurse's absence. This resulted in complete and demonstrative recognition.³

The possibilities of early 'visual memory images'. At about the age of 0;4 there may appear signs of some 'awareness' of an

¹ Op. cit., p. 105.

² *Mind*, Vol. II, p. 290.

³ See Baldwin, *Mental Development in the Child and the Race* (3rd ed., 1906), p. 300.

object that has just disappeared. The earliest and simplest example is when the child turns its head as though to see again a person who has gone behind it, or looks down at the floor for a toy that has fallen: thus Gesell¹ found about a third of the infants he tested looked for a fallen spoon at 0;6 and Charlotte Bühler gives looking for a lost toy as a test for 0;6.²

B, 0;4½ when nursing gazed at his mother's face. I spoke behind him: with an effort he twisted round and looked up at me, then turned and went on nursing, looked at mother's face, and then twisted head up and round to find me. Here B certainly seemed to remember something to look for, even if no image was involved.

At 0;6 B often looked for his toys when he had dropped them. A little later the searching becomes more persistent. Thus

B, 0;7. B's memory has improved greatly of late. Thus he repeatedly looked for a toy dropped on the floor, between intervals (of perhaps half a minute) of playing with another toy. B, 0;9 looked for a lost brush for over one minute; at 0;11 on being placed on my knee he began to search in my waistcoat pocket for my yellow pencil last seen there 24 hours ago; and so again the next night.

At 0;7½ Mrs. Fenton's baby had been playing with a book which the father had hidden under a cushion and then romped with the baby for half an hour. Then the baby turned back to the cushion and extricated the book.³ Stern's child at 1;0 asked for his dolly when it was not there.⁴ Some psychologists regard such searchings as signs of visual memory images; Dearborn, for example, uses the term when his child at 0;4 repeatedly turned her head as far as possible both ways to see a lamp again,⁵ and Stern speaks of a 'memory-picture'.⁶

As it would be generally agreed that an adult can so search for things without a visual image, we can hardly infer that an infant has one. Yet on general grounds it seems quite likely. We know that, at the age at which children can make reliable reports, they seem to have remarkable visual memory: and that eidetic imagery is especially present in very young children. At the age of 5 and 6 two at least of my children expressed surprise, apparently genuine, that I could not see things in their dark bedroom—fairies and little men on the bedrails, seen in vivid colours which they readily

¹ *Mental Growth of the Pre-School Child*, p. 368.

² Bühler and Hetzer, *Testing Children's Development*, p. 117.

³ *Practical Psych. of Babyhood*, p. 175.

⁴ *Psych. of Early Childhood*, p. 112.

⁵ *Moto-Sensory Development*, day 130.

⁶ *Op. cit.*, p. 110.

described. By about one year of age, the babies would 'go into' a fixed stare. Thus

B, 1; 0½. He was gazing into space as often noticed. I introduced a cushion into the line of vision. His eyes did not even flicker. I removed the cushion: still no movement. I introduced it again and at last B's eyes turned to me.

However, as I have said, we can have no proof of the early appearances of images, but they would make some of these very early searchings for things more comprehensible.

The number of impressions needed for an association to be established. When Mrs. Fenton's baby was 0; 5½ he was vaccinated by a doctor, who was always greeted by laughs and crows though the baby at this time had become timid towards all strangers. The child seemed astonished as well as hurt by the pricking, and when after a six-weeks interval the doctor was seen again he was greeted by screams; this terror seemed excessive, and Mrs. Fenton judged that the vaccination incident was in some degree remembered.¹ I have no other evidence of such early remembering of one incident: but my own records deal with less violent experiences.

With B, at 0; 6 and even 0; 7 it seemed that one slightly unpleasant experience was not enough to set up a definite association even momentary. Thus

B, 0; 6. Apparently no learning by one experience yet. Had sweet peas in hand this morning. Put into mouth—very wry face until removed by me. But he was soon again attempting to put them in his mouth. So yesterday—banged his face (upper jaw) with toast rack, cried bitterly for a moment, but immediately was grasping for the rack again.

B, 0; 6½. Learning by experience to inhibit a habit—viz. of putting objects to mouth. Gave him a clean small brush (not hard bristles). B took it and soon put to mouth—slight grimace—brush removed—then after some seconds he returned it to mouth; again grimace—and so on, with longer intervals up to 9th time (intervals now perhaps 2 minutes) when brush was dropped, perhaps by accident.

We must not, however, rely too much on grimaces as signs of displeasure, remembering that a cry is a more dependable sign. As stated earlier, on B's tasting a lemon at 1; 3 his unpleasant grimaces were followed by a request for more.

C, 0; 7. Grasped hot pipe—withdrew with frown. Grasped pipe again after pause of about one minute. Just after grasped it again and then made a square lip (sign of a cry). Repeated after long interval, then turned away.

C, 0; 7½. Suddenly grasped at my pipe and got fingers on the top,

¹ J. L. Fenton, *A Practical Psychology of Babyhood*, p. 173.

very hot, reddened, and yelled hard though soon stopped. A few minutes later (not more than two), I got a cool pipe (empty) and he grasped again. (He had tried again on the hot one.) Apparently association not set up even with pain.

One must, however, admit the possibility that curiosity and an adventurous craving for experience prompted the repetition even of an unpleasant experience, on some occasions when it seems that one unpleasant sensation fails to inhibit.

At 0; 10, however, one severe experience seemed enough.

B, 0; 10. Screamed at very hot milk M gave him from a cup, by error; bent back vigorously at once when cup offered him again, also when I offered water in a glass, he continued crying, occasionally jerking himself backwards into a bent bow: similarly with bottle again until after a lot of coaxing he took it. All right again as soon as first drink taken. Later, again kicked and bent backwards when bottle offered, though very hungry. Once started he took it readily.

By this age also one pleasant experience can at least give a thing 'meaning'.

B, 0; 10½. M put a mouth-organ in his mouth, and she made a blowing noise; a noise was produced by B either by imitation or accident. At once he realized the connexion and proceeded to play it, both by inspiration and expiration, whenever placed in his mouth, which he held open for it.

Association with colour. In experiments with B on colour perception, among others described later (p. 490), there was some evidence, that at 0; 8½, a pleasant reward (honey) given when a blue wool was seized instead of a green, could establish temporarily an association between the blue and the reward, sufficient at least to increase the tendency to choose blue. The association, however, was fleeting, and not carried over to the next day. Dr. C. S. Myers had previously observed a similar association in one of his children at 0; 9.¹

Association and recall in the second year. In the second year we find two lines of development continuing still further: (1) impressions are retained with fewer repetitions and (2) the period of retention or recall lengthens. In the later part of the first year we have few examples of one impression being long retained, and then only if it was a severe one. We have no evidence of recognition of even familiar persons taking place after more than a week's absence: though this may be for lack of suitable opportunities of testing longer memories. On the other hand, it must be borne in mind that biographies are apt to note the striking successes of

¹ See his article, 'Some Observations on the Development of the Colour Sense', *Brit. Jour. of Psych.*, II, 1906-8.

remembering. The average periods may be much shorter and negative results call for no special note.

The clearest and most frequent evidence of association and memory appears in the acquirement of language. Even at 0;10 or 0;11, the meanings of several words, e.g. Daddy, hands, toes, &c., may be understood, and further extension is only dependent on practice. Such meanings, however, are only grasped by repeated associations. The only notes I have of remembering through one experience are concerned with short intervals.

B at 1;5 noticed a book with a house on it, in the revolving bookcase and made his 'click-click' noise—his sign for a house. A day or two afterwards, though the book was on the other side, he pointed at the place and again made his 'click-click' noise. 1;5½. B's memory seems remarkable in certain ways; there may be recognition of a new object, connected with a certain action, even after some days; for example, he evidently remembered that the lid of my silver match box snapped or did something interesting.

That is, an idea connected with a *seen object* is recalled; but he gives no sign of a train of ideas associated with one another. Also there are signs that the idea of a purpose is soon lost; e.g.

B started up from flower-bed with dirty hands, coming towards his mother to have them washed as is his habit, but M remarked, 'He'll forget all about it when he gets here,' and so he did; the climbing of the stone steps was enough.

Something often seen can, however, by about this time be remembered for a surprising length of time. This I noted at

1;6½. Took B with me to the Deutschmann's house into room where canary used to be kept six weeks ago. I purposely never mentioned the bird. Room dark and swathed with dust sheets. He stood silent and puzzled for a minute, then pointed to top of bookcase and said 'Dicky' and began to look all round room for the bird. It is six weeks nearly since he saw it there or was in the room.

This means that an impression at 1;6 was remembered for six weeks. Stern's daughter H at 1;5½ seemed to recognize her old house after an absence also of six weeks, though at 1;0 she showed no signs of recognition of it after only two weeks' absence. His son G, who at 1;6 left their house for four months, was clearly familiar with it and many things in it when he returned at 1;10.¹ The record for length of retention at an even earlier age seems to be held by Dearborn's child, who left a certain house at 1;1 where she had slept in the nurse's (Amy's) room for three months. On returning at 1;10 after an interval of nine months, she said,

¹ Op. cit., p. 217.

'Amy's room,' and when she entered the room, 'Amy's bed.'¹ Undoubtedly frequency and regularity of association are extremely powerful in these early years. I noted, for example—

1; 8. B has never been made to cry by touching hot things; yet his fear of hot things is never failing. This probably because the sensation has been so universal whereas the irregularity of punishment for pulling out my books though sometimes producing tears has resulted in his still pulling them out occasionally.

By this period one impression may be retained by B, even if it is not of a painful or highly pleasing kind. Thus my wife noted

B at 1; 9. When having his supper last night in front of kitchen fire he wanted me to feed 'cocka' (i.e. chuck-chuck, our nursery name for a chicken). I could not think what he meant for a long time until I looked at the boiling pan at which he was pointing, and then realized that it was like the pan in which he had been shown a chicken boiling a fortnight ago. B at 2; 0 was taken to the chemist's and stood on the weighing machine. He was not taken again for three months, but he at once ran and stood on the machine. (It is possible that he saw the weighing machine through the open door at times during the three months.)

Summing up we may say that in the second half of the second year (about 1; 6 to 2; 0) well-known objects may be recognized after a period of several months, and even what appear to be only mildly interesting things or events may be recalled after a few days or even after a week or two. It is noteworthy also that in this period we find not only recognition of objects and persons but recall of impressions associated with them—of events or situations. To give another example: Major's little girl at 2; 0 was given a toy by her grandfather. It was fragile and after only one evening it was put away, and the same day the grandfather went away. Two weeks later it was brought out and she said, 'Grandpa.'²

Impressions retained but not recalled. So far we have only dealt with the recall of impressions, or at least the retention of traces as proved by recognition. Many impressions no doubt leave some trace which is not sufficiently strong to lead to recall, and are never tested by tests of recognition. Indeed, this assumption is implied in the idea that often repeated impressions are needed for any recall or even for recognition. Evidence of the retention even at 8; 0 of traces of impressions received in the second year of life, is given by a remarkable experiment by H. E. Burtt.

H. E. Burtt read over to his boy of 1; 3 three passages of Greek verse (hexameters) every day during the period 1; 3-1; 6. Then three other passages were chosen, and so on, till the age of 3; 0. At the age of 8; 6 the boy was tested with these and with three

¹ Op. cit., p. 180.

² Op. cit., p. 213.

new but similar passages to see how many repetitions were needed to learn them completely. The average number required for the old passages (learned between 1;3 and 2;0) was only about three-quarters of those required for the new, while those learned between 2;0 and 3;0 required only about two-thirds as many.¹ Though the infant was not allowed to play when the Greek was being read to him, his attention at 1;6 or so to such meaningless material can hardly have been keen, and we can surmise that more interesting impressions would leave much stronger traces, if repeated as often or perhaps even less often.

On the other hand, we cannot assume that because something is remembered for a day or two at 1;0 or 2;0 it necessarily leaves a permanent trace.

Memory in the third year. With the completion of two years I find more evidence showing the extension of the span of memory, and that not only of exciting events but of matters of some detail. Thus

B at 2;0½. I stretched him across an armchair (neck and heels on arms) again to-day. Had not done this for a month, and only twice then, but he remembered that a heavy book had then been put on his stomach, and asked for one now. B at 2;2 was heard as he lay awake at night repeating to himself various names and words all from a story about a certain picture in a book which he had not seen, or at least heard read, for five weeks.

Experiments described in Chapter XXII (p. 482), show that even the names of such unexciting things as geometrical shapes (circle, triangle, oblong, &c.) may be learned in a few days at 2;1 and accurately recalled after an interval of five weeks.

Certainly one pleasant experience can now impress itself on the mind. Thus at 2;3 B showed by spontaneous remarks that he remembered that Lorna gave him a tricycle ride nearly three weeks ago. At 2;3 even so mildly interesting a fact that a boy friend had a bruise on his knee, is remembered and spontaneously mentioned five weeks later. An exciting experience like a first visit to a Zoo at 2;4 is described as much as five months later, with some exact details that I had forgotten (e.g. that the hippopotamus would not come out of the water) and about which we certainly had not spoken to him since the day or so after the visit. At 2;4 Y revealed a remembrance of seeing Guy Fawkes two months before. At 2;11, Y hearing the name 'Hilda' at once said, 'Hilda? Hilda took

¹ H. E. Burtt, 'An Experimental Study of Early Childhood Memory', *Jour. of Genetic Psych.*, XL, June, 1932. In a later article in the same *Journal* (L, March, 1937), Burtt reports that the effect of the learning in infancy still appeared at 14;0 but to a decidedly less extent.

me to play on the sands,' Hilda being the name of a girl who took her, for two days only, on to the sands two months previously.

Several other observers, including Stern and Major, state that their children at about 2;6-3;0 recalled events about two months old. That the memory span at the age of about 3;0 may be as much as a year is suggested by the following:

At 2;10 my eldest boy saw me dressed as Santa Claus at Christmas time. Twelve months later I again played Santa Claus, and afterwards asked him, 'Who was Santa Claus?' Shyly and reluctantly he replied 'You were.' 'How did you know?' 'A long time ago I saw Santa Claus and he took off his beard and red cloak and I saw it was "daddy".' It had never been mentioned since the previous occasion.

It is, of course, possible that it may have been mentioned, but very unlikely, as he had no brothers or sisters to tell him, and we wanted to keep the illusion up for a time—as evidently he did too.¹

Sully relates that his boy at 2;2 had a month's holiday at a farmhouse at D—, where there was a sheepdog which used to run after the tennis balls. Nine months later at 2;11 the boy remarked, 'Jingo ran after ball at D—.' Here again it is difficult to be certain that it was never recalled in between. But Sully was able to make another test of the memory of that holiday at D—. When the boy was

5;5, he met a gentleman who had been kind to him during that memorable visit to the sea-side village D—, just three and a half years before, and whom he had not seen since. His father asked the child whether he knew Mr. S—. He looked at him steadily, and answered 'Yes.' Asked where he had seen him, he answered, 'Down at —.' He had forgotten the name of the place. On his father further asking him what he remembered about him he said, 'He made me boats and sailed them in a pond.' This was quite correct.²

Events that take place at 2;6 or 3;0 are indeed not seldom recalled by adults, sometimes with vividness. But here again, it is probable that they have usually been talked about by parents and others at intervals after the event.

¹ None of my own records, however, or any others I know of, approach one of Dearborn's about his daughter. At 2;10 on hearing a rag-man's voice, 'L said, "That reminds me of the rag-man I used to hear when I sat on — (her nurse's) lap in — Park." She left there when she was less than nine months old.' (*Moto-Sensory Development*, p. 191.) This is a remarkable span: but how did L know at 0;9 that it was a rag-man? Dearborn miscalculates the present age of L on d. 1058, giving it as 2;6½, instead of 2;10. I fancy nine months may be a slip for 1;9, for I find that L was still at Central Park at 1;8 (see d. 637), and went back to Nova Scotia at 1;9½ (d. 665). Even so we have a span of over a year back at 2;10.

² *Studies of Childhood*, p. 481.

Sometimes also these supposed memories may be largely filled in with imaginative material. We know this may happen even in adults within a very short time indeed in the course of experiments.¹ In one inquiry among over 200 American College students, however, the accuracy of the earliest memory of each, and its date, were checked by reference to parents and to known facts. Some memories were eliminated as unreliable and others as only going back to 6; 0. Even if we accept the rest as genuine memories not dependent even partly for their retention upon subsequent conversation about the event, it is remarkable that so few of the 200 earliest memories selected refer to experiences before 2; 0—only five in fact. The numbers at the various ages were as follows: ²

At 1; 6	1	At 3; 6	37
2; 0	4	4; 0	60
2; 6	17	4; 6	28
3; 0	39	5; 0	14

Only 22 out of the 200 students remembered anything before the age of 3; 0. Two-fifths of these first memories, we may add, were of fears, and only one-fourth were of happy events, others of anger, &c. It is at least clear that the memory of many unpleasant experiences is not repressed.

It is intriguing to imagine that one can find evidence of the peculiar characteristics of adult memory even in those very early years. I noted about B at 2; 3 that he had an extraordinarily good memory for a simple story, details being given correctly three days afterwards, and yet that, in spite of such excellent memory for stories, he was still very shaky at remembering two simple commissions, e.g. to put something in a drawer and bring a stick; only one of these was done when I tested him. It was also extremely characteristic of B even 12 years later that he remembered so tenaciously the details of stories read and showed an equally striking tendency to forget commissions, even immediately after they had been given! But possibly this is a common failing with children—uninterested as they are apt to be at that age in things that they are asked to do by adults. Indeed, it is probable that aversion may lead to the repression of the memory of an unpleasant task.³

¹ See the remarkable evidence given in F. C. Bartlett's *Remembering* (Cambridge Univ. Press, 1932).

² See *Adolescents: Memories of Pre-School Experiences*, G. T. and M. M. Dudzicha, *Jour. of General Psych.*, XLII, 1938, p. 468.

³ There is ample evidence of the repression of the memory of unpleasant experience in psycho-analytic literature. I have indicated the most striking types of such evidence in Chapter X of *The New Psychology of the Unconscious* (Christophers, London, 1928).

By 3 ; 0 and perhaps by 2 ; 0 children (of the type referred to in my notes and other diaries, with I.Q.s probably of about 120 to 145) have revealed all the aspects of the processes of association and recall. They may make efforts to recall and efforts to learn lengthy lists. B quite obviously tried to learn the names of the animals on his set of bricks at 1 ; 11. Stern's child at 3 ; 0 could recite a poem of 146 lines. There has appeared also, as several examples given above show, that explicit reference of a present idea to a time and situation in the past, which is characteristic of memory proper.

It must be admitted, however, that though the study of learning and remembering by schoolchildren and adults has produced many psychological researches with definite results, there are few researches on these problems in reference to earliest infancy, and few generalizations that we can make based on biographical studies of infants. As we have seen, the reason for this is partly that it is so hard to give absolute proof that an event which happened at, say, 1 ; 0 is remembered for twelve months *without any intervening reminder*: or that the description given by a child of 3 ; 0 of what happened to it at 1 ; 6 is not largely based on what it has heard since.

A number of the examples given above, reported by myself or others, do give at least a strong presumption of genuine remembering over the stated period: and round about 3 ; 0 such reports could be multiplied, especially by such stories as will be given in the chapter on Language. But by this age we have the recollection of older children and adults of events which happened then, though these two can rarely be proved not to have been kept in mind by conversation with others.

What is needed above all is a series of experiments on special points of learning and remembering, for example, Stern's simple experiment showing that a child of 3 ; 6 may remember less of a picture that has hung in his nursery for months than of one which he has studied carefully for a few minutes.¹ I give now a brief account of an experiment I carried out on a particular problem. Others will be given in Chapter XXII.

Experiments on the remembering of direction and position. Experiments on the memory of direction in animals and children by W. S. Hunter² led me to test this particular type of remembering in one of my children. Hunter showed to certain animals a light in one of three directions. An interval was introduced between the showing of the light and the release of the animal. Then if the animal went to where the light was he was rewarded. The same tests were given to a child of 2 ; 6 and to three children of 6 ; 0.

¹ *Psychology of Early Childhood*, p. 261.

² *The Delayed Reaction in Animals and Children (Behaviour Monograph, 1931, II, 1).*

The final results were as follows: it must be remembered that 1 success in 3 may be expected through mere chance.

Only 4 out of 22 rats succeeded when there was a delay greater than 1 second

1 " " 2 dogs succeeded after a delay of 3 minutes

4 " " 4 racoons succeeded after a delay of 25 seconds

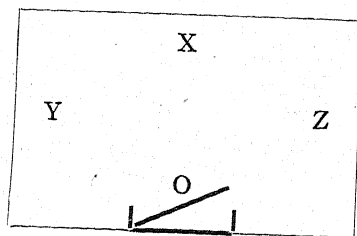
3 " " 3 children, 6 years old, succeeded after delay of 20 minutes

1 " " 1 child, $2\frac{1}{2}$ years old, failed after 1 minute.

Differences of behaviour were more striking. Rats kept themselves towards place and light. Dogs were dependent on keeping their heads turned towards place and light. Racoons remembered even after moving about, and so did the children.

I performed the following experiment on B at $2;2\frac{1}{2}$. It will be noted that in my experiment B was taken out of the room (see diagram below) to play during the interval.

Three envelopes were placed on the floor of the nursery about five feet apart at X, Y and Z, thus: In Y I put a piece of chocolate, in X and Z pieces of wood (to prevent recognition by bulge). All this done in B's presence.



Then I took him out of the room and after a stated interval brought him back by door O. The results were as follows:

Chocolate in Y Interval 1 minute. B at once went to Y and got chocolate.

Now chocolate was put in position X again, in full view of the child. Chocolate in X Interval $1\frac{1}{2}$ minute. Ran towards X, half paused at Y, but did not really stop and on to X and got chocolate.

Chocolate in Z Interval of 2 minutes. Ran to X. I said 'No.' He went to Z, and got it, after putting X tidily back.

Two days later I repeated the experiment three times, each time with an interval of two minutes. Each time now B was successful.

It seems clear, then, that at 2 ; 2 the child B could remember a particular direction at least for an interval of 2 minutes, during which he was occupied in doing other things.

Some special types of learning, e.g. of numbers and the learning of shapes through touch only and sight only will be dealt with later in Chapter XXII.

Summary of conclusions as to remembering. We have seen that some retention of earlier impressions is implied in the earliest recognitions, such as that of the mother's face, which we and others found at 0 ; 3 or 0 ; 4. Even before this the association between feeding and position at about one month implies some retention of impressions at this early stage. But we have, of course, no proof that the efforts of such impressions and associations would remain for many weeks or months if the impressions ceased. The same applies to the associations of meanings with word sounds which may begin certainly before the end of the first year.

For clear evidence, not dependent on one observer, as to the backward span of memory, we have to wait until the age of about 1 ; 5 when impressions retained for six weeks, at least, may be recalled. The experiments with Greek verse showed that even such uninteresting impressions may retain some effect at 8 ; 0. There is no evidence that a few fleeting impressions in the first or second year will be retained ; but there is enough evidence to suggest that oft-repeated impressions which interest an infant even as early as the second year, such as the constant care and affectionate behaviour of the mother, the suggestions made by her, and so on, may be retained for a period of several years at least, even if they were to cease at the end of the second year.

Early in the third year we have clear evidence that experiences at that time may be recalled at least three years later. As we come to about 2 ; 6 we find that experiences at that time are recalled by some adults : though it is exceedingly hard to be sure that they have not been often talked about to the children during the intervals. The known facts, however, about retention at about 2 ; 0, and the gradual extension of the span of memory later, make it probable that specially interesting experiences in the third year at least may be permanently remembered by some people, if not by most.

Early memories revealed in dreams. All our records so far have dealt with recall in waking conscious life. But I have one striking example of the way in which early impressions may be revealed only in a dream. At about the age of 9 ; 0 my eldest boy said to me that he sometimes had a dream that was so real that he wondered whether it had not once actually happened to him. He then described the dream in detail. He saw a railway line and a

little station; he saw me talking to the station-master; and he himself went over a bridge by the station; and there was another railway line there with soldiers by it and a little further off a large pool. This is an exact description of a place near our home in Dundee at the outbreak of the Great War in 1914, when our house overlooked the river Tay and we frequently took the little boy across the railway line there, chatting on the way with the station-master, whom I happened to know. Troops were at that time guarding the railway approaches to the Tay Bridge. The Tay to him would look no doubt like a huge pond.

Here at least is an example of the retention of early impressions revealing itself in a dream, though there is apparently no conscious recall of the actual waking experience.

CHAPTER XX

The Beginnings and Developments of Language¹

None of the child's accomplishments seem so marvellous as the acquisition of language. From a stage when no heard sound has any meaning (except that it may cause a shock if very loud), the child proceeds by associating sounds and situations to a kind of inference as to what adults are driving at, and to the implicit observation of the results of its own sounds. Thus a precocious child may at about 2 years of age use over 300 words,² and more ordinary children by 3 years use over 800 words,³ and understand more. By then a child may also use all grammatical forms, even conjunctions of all kinds, and complex (including hypothetical) sentences. No wonder that Professor A. N. Whitehead describes this as an 'appalling task, the correlation of meanings with sounds' requiring the 'analysis of ideas and an analysis of sounds'.⁴

We must remember, however, that the child is intellectually largely occupied in this task, from 1; 0 to 3; 0, and he is, if mentally active, constantly practising. Indeed, a recent article (in *The Journal of Genetic Psychology*) gives a report of what a 2½-year-old child said in one day—and it occupies 27 pages of the journal.

Most psychological studies of language in the child have been concerned with the development of vocabulary, structure of the language, &c., in the second and third or later years. Yet the first year reveals to us the essential bases of language, even if we require, as the mark of genuine language, that the child shall be aware of the meanings of the sounds or signs he makes and shall use them as a means of communication. Jespersen, indeed, says that the first year is the period to throw light on the origin of language.⁵

Essential elements in the learning of language. The essential bases of language learning seem to be the following:—

(a) Spontaneous expressions of feeling or desire. These are

¹ Some of the main facts and ideas in this chapter were included in a paper read to the Psychology Section of the British Association, Sept. 1933.

² J. Drever, 'A Study of Children's Vocabularies', *Jour. of Expt. Ped.* III, 1915.

³ M. E. Smith, in the University of Iowa *Studies in Child Welfare*, Vol. III, No. 5, 1926, quoted by D. McCarthy in *Handbook of Child Psychology*, 1931, p. 342.

⁴ A. N. Whitehead, *The Aims of Education*, p. 25 (London, 1929).

⁵ See his *Language: Its Nature, Development and Origin*, p. 417.

part of the raw material though they are not language in the proper sense, as Stout points out.¹

- (b) Spontaneous babblings and practice in sound making.
- (c) Imitation of sounds and practice in making these.
- (d) Association of sounds heard with feelings, objects seen or general situations or relations.
- (e) Association of sounds made by the infant himself with responses made by other persons.

The first essential bases for the acquirement of language are, of course, the child's own cries and babblings. Speech in the sense of articulate noises made with the lips, tongue and vocal cords is undoubtedly an innate disposition working at first without any external prompting. If there were any doubt about the innate character of this spontaneous sound-making, it would be removed by the fact that children born deaf babble for a time.

Nor are these sounds only cries. Tennyson's description of the infant 'with no language but a cry' may be true at first, but not for long. With B I noted as early as

d. 10. New sounds—apparently grunts of satisfaction occurring after feeding or a warm bath; d. 16. Contented gurgle made at other times besides after a bath or food. Y. A gentle sighing sound—*ä, ä*, occurred while feeding during third and fourth weeks. d. 21. Guttural vowel sound (*ugh-ugh*) on being placed by mother to feed. (M said that it happened before end of second week.) Here is the first association traceable, and the expression has become anticipatory. d. 27. Contented gurgle after bath and drying more frequent now and distinctly two syllables, *a-coo*. A, d. 27. 'Coos' after drying but with a peculiar sound, coming down from a high note—sometimes continuing after a hiccough. d. 47, makes his 'cooing' sound on being placed in his mother's arms in the feeding position.

Stern at 0; 2½ noted a continued sound *expressive of well-being, especially after feeding.²

By the end of the first month I had distinguished three kinds of sound-patterns:

- (i) Hunger cry: restless, jerky, each cry crescendo to a little outburst and then stopping.
- (ii) Pain cry: (e.g. from wind) a much louder and more continuous cry.
- (iii) Contented gurgle. A's was different from B's; so was Y's, hers being a gentle *ä-ä-ä*, the others giving a more guttural sound.

¹ *Manual of Psychology* (5th ed.), Book IV, Chap. 4, especially § 4.

² *Die Kindersprache*, by Clara and William Stern, p. 15 (Leipzig, 1907; 4th ed., 1928).

We learned to distinguish these three types through experience. Thus more food stopped the type of cry given under (i); exploration, and finding source of discomfort, or patting and relief from wind stopped (ii). (Neither M nor I could distinguish (i) and (ii) so clearly in A as we could in B.) Thus by the end of one month some advance had already been made. Sometimes the advance is so rapid now that it is noticeable in two or three days. Mr. H. P. Williamson also remarked upon this: he noted by d. 23 'Cooing sounds now much more pronounced and frequent than previously'.¹

Early social influences. When the mother or father 'talked' to the child there appeared *responsive crooning* in Y at d. 28, in B on d. 32 and in A on d. 49. Thus speech development was already being linked with social relations. That these responses were not mere coincidences was shown by simple experiments, the method of which was indicated in the chapter on Imitation, p. 174. This testing of the response to 'talking' affords a good example of the way in which actual testing after daily observation in the home may establish a fact earlier than occasional observations by a stranger. Miss Shirley, for example, gives 25 weeks as the 'median' date for this 'talking back' among the 25 babies she studied, and two months as the earliest 'talking back' to a visiting examiner.² The earliest other record I can find is that of Scupin's son at 0; 1½.³ Dearborn's first note is on d. 49; ⁴ Stern's was as late as 0; 2½.⁵

The careful dating of response-cooing by A, B and Y also revealed early individual differences which coincided with all later speech developments, as already shown in the diagram in Chapter I, p. 13.

Early individual differences. Even in these first two months then, differences appear between children in respect to these beginnings of speech, which, as we shall see, appear prophetic of speech developments, besides those given in the diagram just mentioned. Thus already on d. 42 A is noted as 'less noise-making than B' and 'less responsive to our sounds'; and A was later than B in every main item of language development throughout childhood. Earlier still, at 4 weeks, M and I found it harder to distinguish the pain and hunger cry in A than we did in B.

¹ Mr. H. P. Williamson, M.A., formerly one of my advanced students in psychology, kindly studied my rough notes on the development of language, and made comparative observations on his own child. His reports to me reveal that these were recorded with exactitude and caution (like those already quoted in earlier chapters), and they will frequently be quoted—as referring to E. W. Mr. W. D. Wall also noted 'goos' of satisfaction from d. 20. ² See *The First Two Years*, Vol. II, p. 49.

³ See Stern's *Psychology of Early Childhood*, p. 91.

⁴ Op. cit., p. 24.

⁵ Op. cit., p. 91.

Y, on the other hand, was already at this time showing signs of a precocity in speech to a greater degree than B, whom also she surpassed in later speech developments in the second and third years. This precocity seemed closely related to a type of sociability. This was so marked in Y that, for example, on d. 83 even when she was 'yapping', the mere appearance of my face within her range of vision, even without my smiling or talking, was enough to cause her to 'talk' and smile. And later Y, B and X seemed specially eager to respond and to learn, and this undoubtedly helped their language development. I shall refer to individual differences more fully later.

Development of variety of sounds. The next notable step is the appearance of new speech sounds. By the end of the first month there was, as we saw, differentiation between hunger cries, pain cries and contentment sounds. Then begin to appear more varied sounds. Thus I noted:

B, d. 38. Guttural sound very like the French 'r' (repeated 20 times after me).

A, d. 47. A's first consonant—'Ma-a-a.'

B, d. 65. B utters much greater variety of sounds now than three weeks ago. Sharp, high unspellable sounds are frequent. Talks to himself a great deal. d. 83. A labial explosive noted.

B, o; 2½. Throat, tongue and lips are all used in sound making. The sounds of kē, lē and gē have been noted among many hardly distinguishable. In addition to the differentiation of articulate sounds.

Y, o; 2½ uttered a cry of apparent vexation (e.g. when we left her alone) quite distinguishable from that expressing pain or hunger.

Next appear *successions* of different sounds—not a mere series of the same sounds repeated. Thus:

B, o; 3 (d. 91). B's talk is now often a series of 6, 8 or 10 *different* sounds in succession—often shouted. K, L and Th appear by now.

E. W. also at this period (d. 92) revealed a greater variety of sounds, following a month in which quiescent periods (of from 3 or 4 to 8 days) appeared when far fewer sounds were made than at other times.

By this stage of three months it became quite evident from the number of sounds made by these children which we could never have pronounced, that the speech of the child was largely independent of the words it heard; this is further borne out by the fact that deaf mutes utter sounds, and Meumann asserts that they speak the hardest sounds among the first.¹

I made no attempt to gather a complete record of all the different

¹ *Die Sprache des Kinde*, p. 20 (Zurich, 1903).

sounds made at this stage or later. Indeed, they were so many, so varied, and so elusive that it would be difficult for any but a skilled phonetician to do so. I can only say that my definite impression was one which several have noted, namely, that this range of sounds in the first year included sounds not used in English, and indicates a flexibility of speech which speech habits limit later on. Some of the sounds indeed would be very difficult for an adult to imitate. Mrs. Moore thought her child by 0;4 had made 'well-nigh all the sounds in the language'.¹ Preyer, giving a long list of sounds detected in the first year, says that some sounds were made at 0;6 which are not found in German.² The observers of the Dionne Quintuplets remark that children in the earliest months make sounds which perhaps have appeared in no articulate language.³ A recent detailed phonetic record by M. M. Lewis of his son's speech development illustrates the great variety of sounds made by 4 or 6 months, and in one or two cases the difficulty of representing the sound even by the phonetic script.⁴

The practising of speech. About this period of three months began a more specific practising of new articulated sounds. There had been practice of a kind before; a healthy baby indeed seems to be engaged in practice of all sorts from the first weeks. Several times (at 0;2) I noted that B, when lying contented after sleep and feeding, would keep his 'hands, feet, mouth and tongue in constant motion', and that he 'talked a great deal to himself' (d. 67). Mere happiness or well-being seems to result in much exercise of the vocal organs in some way. Thus

d. 73. Much talking, and smiles while nursing; often he lies and shouts loud and long, happy shouts, apparently from mere exuberance of spirits.

Evidently at this stage vocal expression is intimately connected with pleasant feeling in general, long before its use as language proper. At the same time there seems to be a practising of all the sounds in the repertoire; thus:

B, d. 73. Very active making all sorts of sounds to-day. E. W.
d. 92. Coos a great deal to-day, much more than she has ever done, both as regards quantity, quality and variety of sounds.

¹ *Mental Development of the Child*, p. 115 (Psych. Review Monograph Supplements No. 3, 1896, New York).

² *The Mind of the Child*, Part II; *The Development of the Intellect*, p. 105.

³ *Collected Studies on the Dionne Quintuplets*, by W. Blatz and others; section on 'Spoken Language', p. 4.

⁴ See M. M. Lewis, *Infant Speech*, pp. 239 ff. (London, 1936). See, for example, the third column opposite 0;2, 2.

There was certainly no attempt by my children as early as this to imitate specific sounds (only a general cooing response to my talk), and Mr. Williamson also reports of E. W. at 0;3 that she did not attempt to imitate sounds. In this gradual appearance of much greater variety of sounds we seem to have a good example of the result of maturation. From this third month right on towards the end of the first year this practising of sounds and especially of newly discovered sounds went on becoming more and more specific, till finally the children practised words which they were acquiring by imitation.

B, at 0;4½, is fond of exercising a kind of scale beginning with a high note and reaching down to a low one. More consonants are appearing now and being practised.

0;7. Practises 'Dada' (which M was trying to teach him to say) when alone. 0;7½ (d. 224). Practising a new sucking explosive noise a great deal this morning, possibly an imitation of M's mouth-clicking which she often makes to him, and which he seemed once to try to imitate. Also 'la-da' 'di-di' or 'da-de'—constantly repeated this morning as he crawled about pulling a card table to and fro.

0;7½ (d. 225). Repeatedly makes loud quacking noise different from anything heard before. 0;9. Delights in making a new guttural sound.

Notes on the other children reveal this same constant practising during the same period.

The fact that infants of this age constantly babble is, of course, well known. Long ago also it was suggested by Sully and others that the child seems to imitate its own sounds. The further point I wish to emphasize here is more than that, however: it is that a newly discovered capacity to make a certain kind of sound will be *played* with—practised continually for a time, sometimes with signs of great pleasure in the new discovery. Most of the observers of this period do not record this special play with *newly acquired* sounds, though they note the constant practising of articulate sounds.

Professor and Mrs. Kellogg, however, in the record of their remarkable experiment in bringing up their baby together with a baby ape, write that such 'vocalized play' was one of the most striking characteristics of the child's language development at this stage, as contrasted with the young ape, in whom such practising of articulate sounds was lacking.¹ There is little doubt that the constant practice in sound making, especially with newly acquired sounds, is of fundamental importance in the development of speech.

The imitation of sounds. The mere repetition by an infant of

¹ See W. N. and L. A. Kellogg, *The Ape and the Child*, p. 281 (New York, 1933). Stern refers to the play impulse concerning words at a later stage: *Die Kindersprache*, 4th ed., p. 391.

a speech sound made by himself, may be, and has been by some, regarded as a form of self-imitation. At the earliest stage, however, such repetition—the recurrence of the same sound—may simply be the repeated expression of a continuous feeling, as when a happy well-fed baby continues to 'goo'.

The intensive practising of newly acquired sounds does, however, suggest the growth in the infant of a capacity to reproduce at will a sound made by himself. This then would seem the second type of imitation revealed in the development of language. The first, taking the form of 'responsive cooing' or such 'talking back' as was shown in the second month, was only imitation of sound making in general; or if it resembled the parent's cooing it was because the parent had chosen a sound already made spontaneously by the infant. This also would explain Mr. Williamson's record of the early imitation of 'grunts' at 0; 3½. Now we have reached a stage where there is at least an *attempt to imitate a specific sound*. Mr. Williamson noted at 0; 4 'distinct efforts to imitate the mother saying "Eileen", in a high sing-song voice. She succeeded in making a sound at any rate of a somewhat similar nature.' Possibly this very early example was chiefly imitation of pitch and intonation.

My own earliest record of specific imitation is of Y at 0; 5½, who imitated her mother's cough (again a sound she had herself made) and at 0; 6½ imitated my 'ph' sound. A's first imitation at 0; 7½ of a specific sound was that of a clacking noise I made with my tongue.

With B the first sign of specific sound imitation was the gradual learning to imitate the name 'Dada' which M was constantly trying to teach him after about 6 months. The process seems to be as follows:—the sound 'Da' would certainly be among the multifarious sounds he made during the period from 2 to 6 months, and almost certainly would be practised and by repetition give 'da-da'.

The frequent use of Dada by M in my presence about the latter end of this period apparently had its cumulative effect upon him: it gradually became selected for more frequent repetition; and so we find him beginning to say it as a distinct separate sound, though not in immediate imitation when the word was said to him. Thus it was noted that he spoke it distinctly at 0; 7 (d. 210) and several times on d. 211, saying it 'repeatedly' on d. 212, 'practising it' on first waking (d. 216) but with no sign that any significance was attached to it. Then d. 213. 'Imitation of sound da-da to-day on three occasions within an hour, though two or three times there was no such imitation.'

These deliberate imitations, however, were strikingly different from (a) the spontaneous or (b) the deferred-imitative speaking:

they were now *whispered*. I also noted this imitation was 'quite different from babbling: so deliberate and suggestive of effort' yet without the vigour that prompts spontaneous emotional babbling. Similarly, when A at 0;9 imitated a labial noise I made (in fact an attempt to imitate him) it was a whispered noise. Precisely the same happened with C at 0;9. When I imitated a new joyful noise of his he imitated me, but now the sound was whispered. When I was trying to get imitation I sometimes, indeed, noticed movements of the lips without any sound. Again, Mr. Williamson noted of his daughter at 0;8, when she was learning to say 'Ta-ta', 'She will sometimes whisper it when she will not say it aloud'. Preyer says that at 0;10 attempts to imitate sometimes only resulted in 'silent movements of the lips': also at this stage his boy began during his long monologues to whisper.¹

There seems here then to be some change in the process of speech, reminding one of the change from the free, vigorous, haphazard, spontaneous movements of the first few months to the deliberate, slow, clumsy, volitional movements, and even of the transition from reflex grasping to voluntary grasping. (See Chapter VIII, p. 104.) The next stage is the acquirement of meaning which we shall deal with directly. Here we may summarize this section by pointing out that a further type of imitation of speech reveals itself in this period—but first of a very slow, deliberate kind, suggestive of effort, and sometimes resulting in only a whisper, or even in no sound at all.

It has been asserted that an infant will only speak a word it had learned to understand. All depends on what is meant by 'speaking a word' and by 'understanding'. It seems fairly certain that B made the sounds 'Dada' deliberately and imitatively (and not merely as spontaneous babble or as an expression of pleasure), before he understood its conventional meaning when heard.

Stern also records the imitation by his daughter of 0;8 of 'Papa', though its meaning was unknown to her, and similarly 'Mama' imitated two months before it was understood at 1;0. (Both mother and father were first called 'Mama': a month later 'Papa' was used often even for mother; once 'Pa-ma' was used for father.)²

It seems, however, to be true that understanding a word and response (for example, looking round for 'Dada' or 'Pussy' when the name is heard) usually comes before speaking that word *with understanding*, for example, using it to call the father or the cat. As we shall see, after the first beginnings at least, many more words are understood than are spoken.

¹ *The Development of the Intellect*, p. 109.

² *Die Kindersprache*, p. 19.

The development of children born deaf. Some observations on children born deaf are relevant to the topics of the last few sections. I quote first some records and conclusions based upon the work of Professor F. A. Rau and his wife, who have worked on the speech training of the deaf in Moscow for over thirty years.¹ The first striking difference between the normal and the deaf infant is that though the latter babbles as early as the normal, he soon confines his babbling largely to times of special excitement (hunger, pain or happiness) or to when he sees a face bent over him. 'At other times he lies silent.' This confirms the view that at a very early age, the infant's early babbling is greatly stimulated by the sounds it hears others make or (and) by the sound of its own efforts.

The babbling of one deaf infant (Carl) by 0; 3 $\frac{3}{4}$ was 'mainly when one speaks to him'. At 0; 5 'to a smile and a few words he responded with the sound "ng"'. At the sight of his mother's breast he fidgeted "but never makes the characteristic vocal sounds we noticed in a normal child". Carl quietly cries "ah" and that is all. By 0; 6 at the sight of the breast he is "usually silent", the babbling is monotonous, lacking the "medly of variations" in the normal child. By 0; 7 $\frac{1}{2}$, "Carl has ceased to babble"—"of the sounds he used to make when playing or excited there remains only the back-palated *gkh* and the long monotonous *M*". Yet he "screams happily and laughs loudly". Carl was not observed again till 2; 1 $\frac{1}{2}$, by which time even a cry at being taken away by his mother against his wish has become the 'opening of his mouth without a sound . . . a tragic grimace'.

It is a pathetic picture of the slow disappearance in an otherwise normal, intelligent child of the making even of sounds he once did make, through the lack of the stimulus of his own and other person's sounds, and of a growing understanding of the utility of making appropriate sounds. Though the power to make the sounds remains, the play period of purposeless babbling is past, and nothing has come to take its place.

Gesture Language. A familiar theory of the origin of language in mankind is that it was through the use of gestures, but the part played by gestures in communication seems to be very slight in intelligent children who are encouraged by their parents in their use of speech. The earliest movements by children which might be called gestures are those which seem to be the innate expression of feelings or desire: as when a satisfied baby turns his head vigorously away from the preferred bottle or pushes it away (a gesture characteristic of the 6th month),² or when he stretches out his arms

¹ The material is gathered from the articles by Helen G. Smith, translated and condensed (from the book by Mrs. E. F. Rau) in *The Volta Review*, Sept. 1935 (Washington, U.S.A.).

² See *Feeding Behaviour of Infants*, by A. Gesell and F. L. Ilg (Philadelphia, 1937), p. 53.

towards an object he wants, even if it is beyond his reach. Here, however, is no deliberate use of a gesture with intent to convey a meaning—the criterion of language proper. But it is not difficult to see how such natural expressive movements could develop into a significant gesture. The stretching out of the arms often secures the wanted object; and the child even when he is old enough to realize an object is right out of reach becomes more explicitly aware of his action and its sequence and finally uses it deliberately to the adult present.

Apart from such gestures which were apparently derived from original expressions of feeling and desire, neither Y nor B displayed much genuine gesture language at this early period. At 1;0 B made sucking noises to show that he wanted a drink, but before 1;0 I have only one note of a genuine gesture by B and that was imitative in origin. Thus:

B, 0;11 (d. 315). Nurse has taught him to hold up his hand and snap his fingers to birds. Now when I say, 'Where are the dickie birds' he looks up at them and snaps (noiselessly) thumb and finger. d. 316. B held out his hand and snapped his fingers to his sponge and later to his bottle.

It looked as though it had now become a general sign for desire for a thing. In view of this I am surprised to find that I noted 'the first pointing' at 1;1½ and then a week later that 'he now points at anything he wants'.

Y used several gestures before or about 1;0. The earliest was at 0;9½.

'Makes blowing noises to her granny to make her blow the whistle in her speaking-tube.' 0;10½ shook her head when Mrs. P. was inviting Y to come to her from M. (I was called to see it, it was so clear. But this may be regarded as an *expressive* gesture and not *communicative*. Similar head-shaking for refusal occurred in B at 1;0.)

Two more gestures occur at 1;0, namely, snapping of fingers to ask for things (first used to call the 'dickies', also an imitation of a nurse's action) and kissing sounds to ask for her doll, which she often kissed and held out for others to kiss.

It will be seen that one of these gestures is expressive of desire and the other (hand-waving) may be an expression of the feeling at parting, or going out.

We shall discuss gesture language more fully when we have traced the language development of 1;0-1;6 (p. 388).

The dawn of meaning. The various possible stages in the development of the meaning of sounds would seem to be these:

(i) Spontaneous cries or 'coos' due to certain feelings or sensations.

(ii) The association of feeling with the cries or sounds which express that feeling, so that in some vague way the feeling is aroused even when the sound is made by another.

(iii) The imitation and repetition of selected sounds frequently heard—but without understanding.

(iv) (a) The association of these imitated sounds with some person, object, situation or feeling.

(b) The association of sounds heard (but not spoken) with persons, or objects, or situations.

Of the two types given under (iv) we cannot yet say whether either necessarily precedes the other. In early months the crying of one baby has been noted by various observers to produce crying by another, and I have referred to this in the chapter on Sympathy and Affection (pp. 293 ff) and given my own observations there. Such responses may be due to fear caused by various noises; but we saw in the chapter on Fear that familiarity with a sound soon abolishes the fear of it. As stated in the chapter on Sympathy and Affection, sympathetic crying was noted in A as late as 1;3, and by several observers in children of 1;1 and 1;4; so there may be an inborn tendency to experience, on hearing a certain cry, the feeling which the child itself expresses by such a cry.

If so, it may be necessary that the heard cry should be a fairly close copy of the child's own. My own attempt to imitate B's cry at 0;5½ made him actually change from crying to sudden laughter.

At present, however, we are concerned primarily with the growth of meaning of *articulate* sounds.

The understanding of spoken language in the first year. Most observers record the understanding of some words before the speaking of words with intent to communicate. This seems true of Y. Certainly at 1;0, her 'passive' vocabulary, as the foreign language teachers call it, decidedly surpassed her 'active' vocabulary. Thus Y used no words at 1;0 with the doubtful exception of 'Dada', 'Mama' and 'Baba'. But she is noted as 'understanding' 'pat-a-cake' at 0;7½—responding by clapping; and at 1;0, Y understood the following words, as shown by the responses made: 'pussy' (looks down on ground for it), 'dickie' (turns to birds on wallpaper and kisses them), 'kiss' (offers kisses), 'pull your hair' (does so at once), 'mouth' (opens it), 'bottle' (makes smacking noises), 'wave handy' (does so), 'No, no' (shakes head); and a note is added in my record that this list is 'very incomplete', even at this early stage.

Earlier and much more constant efforts were made to teach B to speak words with understanding. In spite, however, of the child's strong impulse to speak, and to imitate speech, and in spite of special 'coaching' resulting sometimes in words being well

spoken before they were understood, this stage (at about 0;9 to 1;0) was no doubt even in B's case largely occupied with the learning to understand words heard.

There were, indeed, words understood at or just after this period by B and Y and others which we never dreamt of trying to make any of them say at the time. I have no doubt whatever that it would have been futile. (See the experiment on the imitation of words to be described presently, p. 390.) For example, at 0;10 B understands 'wave hands'. The notes again indicate an interesting stage in the process.

Days 290-300. Being taught to imitate (seen) hand-waving at 'good-bye'. Sometimes did it, sometimes not. Words 'wave hands' would usually be spoken as well to him. d. 307. B waves his hands immediately when I said 'wave hands' though not to 'wave' alone or to 'hands' alone. d. 308. Did wave his hands to-day to 'wave' alone and 'hands' alone, after hesitation.

Very soon, after these first learnings by B we found definite evidence that more words were understood than spoken (e.g. at 0;11½ he understands toes, dickie bird, blow your nose), and undoubtedly from this period, understanding covers a wider range than speaking, and especially from 1;0 to 1;6.¹

In the meantime, however, in this period (0;9 to 1;0) there were a few words which B at least began to speak, apparently with some meaning. B's case was no doubt peculiar because we made special efforts to teach him. I will give his records.

B, 0;5½. Faint signs of recognition of his name 'Baba'. When he was on M's knee I stood in corner of room where he could not see me and spoke a series of names all in same tone—e.g., London, Taylor, Pitlochry, interspersed with Baba and Dada. Only 'Baba' produced a smile three times and 'Dada' once: but they failed to do so two or three times, and they failed again on d. 185.

0;6½ (d. 204). Again a test with a series of names of places interspersing 'Baba' four times. Each time he smiled at 'Baba' but never at the other names. He was not looking at me so the smile . . . could not have been in response to any change of expression. So at least some familiarity with the sound was probably felt. d. 227. He pronounced 'Baba' distinctly. It is hard, of course, to be sure that some special familiar intonation was not given by me to 'Baba', though I tried to pronounce all the words as mechanically as possible.

By this time (0;7), as we have just seen, 'Dada' was distinctly pronounced in imitation (d. 210 and d. 217), and was being practised (d. 216). But there was as yet no evidence that any meaning was

¹ Stern can be quoted in support of this if needed; see *Die Kindersprache*, Kap. III.

attached to the sound, though M was constantly trying to teach him, for example by saying 'Here's Dada' on my approach. On one occasion (d. 217) he said 'Dada' on hearing my voice in the next room. But this might be a coincidence as he had been practising it the day before. Also on d. 227, B smiled when he met me, and he began to whisper 'Dada'. Apart from this it was not until 0;8 that there was any evidence of 'Dada' having some meaning. Thus:

d. 250. Not much doubt that he now associates 'Dada' with me. He said it both times he saw me this morning, and has repeated it thirteen times already to-day (by 10 a.m.) in my presence though not at all when I was absent.

Later the same day. Has said 'Dada' about seventeen times to-day (that is four since previous entry) altogether in my presence and M reports only about twice when I was not there.

This suggests that with the definite association of some meaning, the spontaneous practising or deferred imitation of the word tends to cease, not, I think, merely because the speaking of it is thoroughly mastered, but for a similar reason to that which made the children unwilling to imitate certain actions which already *meant* something to them as we saw in the chapter on Imitation (pp. 193, 194). At 0;9½ (d. 283) B began to call M 'Mammam'. At this stage it *looked* as though 'Da-da' had begun to 'mean' the father to B, and 'Mam-mam' the mother, but we shall see that there is a more complex significance.

The affective and conative aspects of early speech. The earliest differentiated expressive sounds (in the 5th and 6th weeks) are apparently attached to sensations of pain and hunger or to feelings of contentment and pleasure. The first articulate word-sounds have usually been supposed to be associated (as we have just discussed) with persons or things—a marked change. Notes not yet quoted show, however, that in spite of the constant attempt on the mother's part to teach B that 'Dada' meant his father, the tendency to use sound-making as an expression of feeling or desire was still predominant. As indicated, the first clear use of 'Dada' at 0;8 was the speaking of it when seeing me. But so far there was nothing to show whether this was a sound now associated with the appearance of the father or an expression of feeling called forth by him.

By 0;9, however, there were clear indications that 'Dada' was frequently, if not always, an expression of feeling. Thus I was surprised at first to note that B said 'Dada' especially often when playing with his toys, and I noted on d. 289 that B said 'Dada' when very pleased and interested in a thing'. Now my presence usually involved a game and fun of some sort. So it seems that

the first real meaning, even of 'Dada' (which his mother had constantly tried to make him use to indicate his father), was largely a *feeling*, perhaps spreading from father to toys through a common feeling-aspect.¹ Even as late as 1; 1, M's playing the piano made B march round the room shouting 'Dad-dad'. Similar notes were made of C also at 0; 9. Thus:

C at 0; 9 seems to use 'Nan-nan' for mother'. C at 0; 9½ does not apply 'Nan-nan' (mother) to toys as he does 'Dada'. At 0; 11, 'Nan-nan' now seems to be generalized into a cry or a symbol for the things his mother supplies, as 'Dada' is a father-joy-play cry.

Unfortunately I had not so much time to play with X. She did not need me so much because a brother 'Billie' was her constant guardian and playmate: and this provides me with a beautiful confirmation of the above interpretation of the significance of Dada. For a similar use of 'Billie' by X was noted when X was 1; 3. X shouts 'Billie' not only when she sees him but apparently as an exclamation, when at play or excited.²

A similar reason may explain Y's generalized use of 'mam-mam'.

Y at 1; 0¾ cried 'Mam-man' after M left the room; but a few days later cries the same when S (who does much for her) left the room; and (1; 1¾) shouted 'Mam-mam' at her father with a smiling face when M was out of the room. Y looked affectionately at me as she said it; so the meaning of the word may not be confined to M but may express a general feeling of attitude.

Stern also noted an interchange of 'papa' and 'mama' in the first stages of learning by his daughter by 1; 0. At first, father and mother and young girls were called 'mama': then 'papa' was used for the father and often for the mother. Once 'pa-ma' was used and even at 1; 4½ the father was often called 'mama'.³

Some of these interchanges may, of course, be due to confusion in the learning stage. But that could hardly explain the use of 'Dada' by B, or of 'Billie' by X when playing with toys, or C's use of 'Dada' for toys and only 'Nan-nan' for food.

¹ These observations and their interpretation were made many years before I read Meumann's theory of generalization of early words through a common feeling; so that they supply an independent evidence of that. See E. F. Meumann, *Die Sprache des Kindes*, p. 58 (1903). The influence of a common feeling or common use was stressed in my Presidential address to the Psychology Section of the British Association, 1930.

² This example suggests that it is unnecessary to conclude that *Dada* was derived from an *innate* expression of pleasant feeling, such as I gather would be the view of Dr. M. M. Lewis based on his phonetic records. But it would leave the possibility that in some cases the earliest words are so derived. See M. M. Lewis, *Infant Speech*, Chap. VIII.

³ *Die Kindersprache*, p. 19.

The truth seems to be that, at this early stage, affective or conative elements are dominant in speech, though by persistent teaching cognitive elements may begin to have some influence. Later on as we shall see the cognitive element becomes the determining factor—so that for B 'Dada' means father and then soon afterwards men like him, and ceases to be used when merely at play. The present stage seems to me to be looser, more fluid and variable than Stern's representation of it in his *Kindersprache*. Such early words he thinks have their affective significance but 'the affective words are likewise, at least originally, tied to a definite situation; which, as it were, exhibits its objective components'.¹ Thus Stern's boy's first word 'Da' was for a long time called forth only by 'something coming out from under a covering', and Deville's little girl at 0; 10 uttered the cry of 'eu'—but not as a general cry of horror, but only when she had dirtied her hands.² I agree that such definite limitations to certain situations occur: but the usage in some cases seems very vague—as when B shouted 'Dad-dad' when he marched about to a tune.

When statements are made as to the early use of *names*, we must always bear in mind this probability that they are primarily expressions of feeling or attitudes. Sometimes the early speaking may be really an immediate imitation, and then it is no more significant that the child should repeat a name than that he should repeat a nonsense syllable. These comments may apply to some of the very early learning of the first name, in the table given by Charlotte Bühler, according to which 23 out of 49 infants had learned their first name by 0; 10 or earlier.³

The history of the use of 'Ta'. What has been said about the significance of Dada for B and C, and Y and of Billie for X and Nan-nan for C, may be supplemented by the records of the other earliest word freely used by B, namely, 'Ta', which we made constant efforts to teach him to say as a request word, by holding up a toy he liked and repeating 'Ta' to him, and waiting till he imitated before giving him the toy.

B, 0; 9 (d. 275). Several times said 'Ta' when told to *before* toy given (M has been trying to teach him this several days). d. 278. Says 'Ta' very distinctly in imitation of M and more faintly when something is given him (and so d. 285 and d. 299, without our saying 'Ta'). d. 305. Said 'Ta' when he found a napkin on the floor, without anyone giving it to him. d. 307. Put his hand out when I said 'Ta,' even without my offering to give him anything.

A note on X at a similar age (0; 10½) shows that even when X refused to imitate the sound 'Ta' she said it (always faintly)

¹ Op. cit., p. 182.

² Ibid.

³ See *Kindheit und Jugend*, p. 95.

four times on being given a pencil, and once when it was offered, out of seven tests

The very varied objects for which 'Ta' was said made it unlikely that it was merely a name. Thus at

0; 10½ (d. 327). M played B's mouth-organ and gave it back to him. B at once gave it back to her saying 'Ta,' apparently to have it played again—and so repeatedly. d. 328. 'Ta' said repeatedly on getting at a thing wanted (not given by a person).

The next note, however, does suggest some restriction, if 'Ta' is expressive of an attitude or desire.

0; 11 (d. 332). 'Ta' seems to be used especially in connexion with toy objects—never, e.g., for milk or as a request to be taken up. Sometimes says 'Ta' several times *after* toy is given. d. 339. 'Ta' said when trying to reach his trumpet on floor—not spoken to us at all. (So it seems here expressive of a desire.) 1; 0. Said 'Ta' when offering me a toy: then puts his hand out for it again, saying 'Ta.'

We have already seen that the earliest acquired gesture made by B seemed to express a conative attitude, viz. the snapping of fingers (at 0; 11) first performed on seeing 'dickies'. This might have been interpreted as a sign for 'birds'. But also at 0; 11 B snapped his fingers to his sponge and later to his bottle, and later it was done frequently towards anything he seemed to like, and perhaps to want, e.g. to pictures, or to his father. On d. 354. This snapping of fingers coincided with 'ta' when told to say it for some fruit, suggesting again that both express a conative attitude. Again, as late as 1; 4. Fingers snapped to me to make me repeat tickling, after saying 'a-g-i-' (again) for same purpose. Y (at 1; 0) snaps her fingers at various things she seems to want.

The early understanding of the negative at 1; 3 (d. 476), when B would shake his head at 'No, no,' is possibly due to the negative being first an expression of a conative attitude: the origin being the turning of the head away when refusing more food. There are certain notes, however, which suggest that 'Ta' (like 'Dada') may function in something more than the expression of vague desire. We have already seen that at one period, with B, it was used only in connexion with toys and not with food: again, at 1; 0 (d. 365), B says 'Ta' in *giving* me a piece of paper, as well as in asking for it back. Y's first use of 'ta' at 1; 0½ was when giving me back a box, just after I had been saying 'ta' frequently—so the word seems to be momentarily at least associated with the act of giving as well as that of receiving.

As to Y, whom there was less attempt to *train* to say 'ta', I noted at 1; 0 that no word was used consistently, with the doubtful

exceptions of 'Dada', 'Mam-mam' and 'Baba'. Some words were quickly learned, however, when specific training began; thus:

Y, 1; 0 $\frac{1}{2}$. I tried to teach her to say 'Ta' as a request word. The first day I only got faint indistinguishable sounds. But two days later 'Ta' was said when giving me back a box which I had just given her after myself saying 'Ta' frequently. This follows only two days' attempt to get her to say 'Ta'—including four or five lessons, hearing M and me saying 'Ta' to one another to get something.

Other notes are as follows: they illustrate the fluctuations one must expect in trying to teach words at this stage and the danger of interpreting one or two correct uses of a word as a proof of mastery.

1; 0 $\frac{3}{4}$ (d. 390). I tried to get Y to say 'Ta' when offered toast; Y gazing at toast, not at me, said 'ă', apparently inadvertently, not with any of the whispered effort.

1; 1 (d. 395). The clearest 'Ta' I have heard so far: she crawled to door, stood up and fumbled at the door handle and said, 'Ta-ta,' repeatedly. Later she flopped down, gazing at door, and said 'Mam-man,' though M was in the room behind her. Later she pulled and tugged at handle, and when I opened the door she crawled through at once.

1; 1 $\frac{3}{4}$. Have not tried to teach her 'Ta' again the last few weeks, till yesterday. To-day I heard a faint 'Ta' when she was digging for something. Later M heard her practising 'Ta, ta,' not asking for anything; and later again when S was trying to get her to say 'Ta' her mouth would vigorously form to say it, though only one doubtful 'Ta' came at the end.

1; 2. Y was yapping for a gaudy toy; I said 'Say Ta.' She was silent quite a time and then cried again. I said 'Ta': Y silent again. Then I gave it to her. At once came *whispered* sounds, two or three indistinguishable; then a clear 'Ta.' As she played with it I heard repeated whispered sounds, with several clear 'Ta' sounds. Later a *shouted* 'Ta,' repeated again. Why can she not say 'Ta' before getting the thing she wants? Possibly the state of unrest hinders it.

Y, 1; 2 (two days later). At once said 'Ta, ta' (whispered) to M when she offered a book saying 'Ta.' Later, as she held book said, 'Ta, ta, ta, ta,' very rapidly. (Six days later.) Held her hand towards a cigarette-case I had. I withheld it: a sharp cry: then a kissing noise; then cry again; I said 'Ta' and at once she said 'Ta.' I gave it her and she repeated 'Ta, ta, ta.' Just afterwards I took it again. Cry repeated; twice cried; no 'Ta' till I said it again, when 'Ta' followed at once. By two weeks later 'Ta' was thoroughly established as a request word.¹

¹ It is interesting to compare this learning to 'Ta' with the attempts of Yerkes to teach his chimpanzees to learn, by imitation, request-words for food. See Yerkes and Learned, *Chimpanzee Intelligence*, Part I, Chap. 6 (Baltimore, 1925).

It is remarkable how early this acquired expression of a wish—'Ta'—can be used for a natural expression or cry. Thus:

1;0. B crying lustily for stick. M said 'Ta.' He stopped crying at once and said 'Ta.' 1;0½ (d. 383), crying to have arms released. I said 'Say ta' and at once he said it. d. 388. A pathetic instance: B burnt his hand slightly on a hot poker. In the midst of sobs he checked himself and said 'Ta, ta' repeatedly. d. 391. Checked a scream repeatedly and said 'Ta' (when M insisted on his sitting down). 1;3 when M gave him a crust, there came first the acquired 'Ta' and only after this the grunt of pleasure.

Summing up these records of 'Ta' we may conclude fairly certainly that for both B and Y 'Ta' was not the name of a particular thing or person, but usually the expression of a desire, though sometimes it seemed to come as an expression of satisfaction. Some might regard it as a mechanical association with a certain type of situation or as a tendency to complete an established form or 'pattern': but this hardly seems likely in view of the occasions on which B checked his crying and tried the 'Ta'. We have also already concluded that 'Dada' for B and 'Billie' for X were not (or not merely) the names of persons, but expressions of pleasure or excitement of a play situation: also of A it was noted that apart from a few onomatopoeic sounds, his speech at 1;5½ was almost confined to 'Mam-mam'—a general request word.

The significance of first words. The records of several of the most dependable observers also suggest that the first word spoken had similar uses to those I have described for B and X and Y. Thus Professor Carl Stumpf noted that the first word spoken by his son at 0;9½ was 'papn-mapn' meaning 'to eat', but which for a time appeared to be a general pleasure-word. His second and third word also ('ku' at 1;0 and 'gaga' at 1;3) were apparently signs of pleasure.¹

Miss Shinn, who watched the development of her niece almost hourly in the first year or two, recorded the following three first words all at 0;10—'da' as a demonstrative sound, 'nanana' as a sign of unwillingness and protest, and 'mamama' as a sign either of dislike or of longing, only later as a name of the mother.² Major gives as the first word at 1;1 (before there was any naming of things) the sound 'hi' as expressing desire, and accompanying the stretching of the arms to the thing wanted.³ Preyer records the special sound 'orro' as a sign of content as early as 0;6 (resembling the sounds made by B under like conditions) long before

¹ See Stern, *Die Kindersprache*, pp. 173-4.

² *Biography of a Baby*, pp. 225-30. [Quoted by Stern, *Kindersprache*, 4th ed., p. 176.]

³ *First Steps in Mental Growth*, p. 318.

naming things occurred. He was doubtful as to the significance of 'atta' at 0; 11, often uttered when something had disappeared: and subsequently records at 1; 0 'a-na' or 'a-nananana' as an expression of longing. This child did not use a name of a person until 1; 7, when he used 'papa' for the father.¹

Mrs. Moore's child at 0; 7 indicated by 'momma' hunger and other discomforts; 'bob-ba' indicated 'comfort and good feeding'. Only at 0; 9½ were 'papa' and 'mamma' associated with his parents and 'not exclusively' with them.² Perez quotes records, by one he regards as a most competent observer, showing that the earliest expressive meaningful sounds made by the child observed were 'ah' (expressing astonishment or contentment), 'ha ha' a demand for something seen, 'ah' (expiration) indicating all sorts of objects, 'ha' (sustained) expressing general admiration: and so on.³ M. M. Lewis gives first in his list of first words of his boy K 'mammamm'—when mildly lacking something, later used for 'mother'.⁴

There is little doubt then that even at this stage, which is regarded as the beginning of the language of 'words', and not merely expressive cries, the first meaningful articulate sounds are usually the expression of feelings or conational attitudes. No doubt in some of the cases in which the words 'papa' and 'mamma' are recorded as the first word used properly and as standing for father and mother alone, observers may have overlooked other uses (or other words) because they would be looking out for and trying to teach 'papa', &c.

In the case of B it looked as though the attempt to teach him 'Dada', resulted in the word becoming expressive of the feelings or the situations with which the father was most often associated, namely, those of play. Similarly with Y, 'Billie' was spoken constantly when she was playing with him and it became for her expressive of play and fun as well as a symbol for the boy himself.

No doubt some of these earliest words grow out of expressive cries originated by the child himself as, for example, the *mamamam* of Miss Shinn's niece. The objections made by Stern to the view that words are invented by children seem to refer to a later stage. Supposed 'primitive creations', he says, 'are never absolutely proved.'⁵ Yet Stern himself in the dealing with the very beginnings of speech says that 'An elementary note of aversion, "a", is used by many children as a real word, expressive of disgust', while

¹ Op. cit., pp. 111-12.

² *Mental Development of a Child*, p. 121.

³ Quoted by B. Perez in *Les Trois Premières Années de l'Enfant* (p. 291) from M. A. de la Calle, *La Glossologie, Essai sur la science expérimentale du langage*, 1881.

⁴ Op. cit., p. 255.

⁵ *Psychology of Early Childhood*, p. 159.

'da' is a natural demonstration: and observation, he says, shows that sometimes a child can 'independently raise a natural sound-expression to a real designation in speech'.¹

Dr. M. M. Lewis, who is a skilled phonetician, traces the resemblances of the earliest words of different infants such as (a) mama and (b) dada to early sounds expressive (a) of want or distress and (b) of comfort and satisfaction. Such a connexion seems traceable in some of the records of his own boy and of others; but the evidence of different observers is very varied and at times conflicting. For example, Lewis himself records *mammam* as spoken at 0; 8 when in a state of comfort and also when in a state of discomfort.² A number of the examples I have given above also do not seem explicable in this way.

*Language in the second year*³

Onomatopoeic words. Onomatopoeia properly interpreted is 'the formation of a name or word by an imitation of the sound associated with the thing' (Oxford Dictionary). The mere imitation of a cat's mew or a dog's bark or a motor horn is not necessarily onomatopoeia—the sound must be used as indicating the object.

Now with our children the imitation of a few sounds other than the human voice began shortly after the imitation of specific words, spoken by us. Thus Y at 0; 9½ imitated a motor horn. E. W. at 0; 11 listened attentively to a lamb bleating and then imitated the noise several times, pausing occasionally to chuckle. Preyer's son imitated the cluck of a hen and the creaking of a wheel 'of his own accord long before he could speak a word'.⁴ But this imitation of sounds does not make them *words*: nor does the child's imitation of an adult's imitation of a dog's bark constitute onomatopoeia. Preyer himself thought that original onomatopoeic words are very rare in children and he observed them only after the children already knew some words.⁵

My own children showed at least some slight development of acquired speech before the first onomatopoeic words were made, and then they were helped by adults.

B, 1; 0½ (d. 380). Makes a poor imitation of 'Bow-wow' (be-be) when I said it while he was looking at dogs in a picture. d. 396. Looking at picture book B said 'Bow-wow' to dogs only (six times) and not to cats.

¹ Op. cit., pp. 146-7.

² *Infant Speech*, p. 241.

³ Published studies on the growth of language after about the age of one year are more numerous than on any other aspect of early development, the most complete being Stern's *Die Kindersprache*. In the rest of my own chapter I select the more interesting psychological aspects and those on which I have some new material as evidence.

⁴ *The Development of the Intellect*, p. 91.

⁵ *Ibid.*, p. 90.

1; 1 (d. 404). Noted squeaking like M's mewing at cat's picture and *bow-wow* at dog's pictures (also probably encouraged by M's saying 'bow-wow').

Bow-wow was soon curiously 'transferred'; for

B, 1; 1 $\frac{3}{4}$ (d. 419). 'Barks at pictures other than those of dogs.'

Characteristic sounds continued to be used as signs for some time. Thus:

1; 4. Sucking sound was used to indicate water almost certainly spontaneously, and 'click-clack' instead of occasional 'gee-gee'. Imitative sounds still made spontaneously when he sees trains, horses, birds and sheep. 1; 5. Constantly makes appropriate sounds when he sees horses, train, dogs, sheep, &c.

Precisely the same was noted of Y at this same period. Later she also imitated the sound of the motor horn.

No doubt in many cases the apparent imitation of an animal sound is really an imitation of the adult's imitation of it: for example, B on d. 380 and d. 404 quoted above. Stern thinks that in the great majority of cases such words are really imitations of the sounds made by adults.¹ Half his daughter's vocabulary at 1; 6 consisted of onomatopoeic words. Obviously much will depend on the extent to which a parent tries to teach the child such names. The sounds would at least have the added interest of being made also by the cat, dog, &c. Dearborn's child preferred to use 'Bow-wow' and 'Mieow' at 1; 6, though she understood the names 'dog' and 'pussy' quite well.² Similarly B at 1; 11 seemed to prefer an onomatopoeic word to easy equivalents. E. W. having learned to shout 'a dod' 'a dod' at the sight of a dog, as early as 0; 8, 'later spontaneously changed to calling dogs "bow-wow" (exact date unrecorded) and continued this until about 2; 0. At 1; 1 $\frac{1}{2}$ she used "moo" for a "cow" and though later taught to use "cow", still at 2; 0 usually preferred "moo". Mrs. Fenton's boy at 1; 3 after a visit to a farm-yard abandoned his name 'chee' for chicken in favour of 'kwah-kwah': and later changed horse to 'Shee-hee' after hearing one whinny.³ Where there is only a mild impulse to learn speech this added interest of animal sounds may be useful. Thus A's development of speech was slower than B's or Y's and it was noted:

A, 1; 6. Imitative sounds—'bow-wow' and 'cluck-cluck' now appear, although his speech is almost confined to 'mam-mam'—a general request word.

¹ *Die Kindersprache*, Chap. XX, Section (2).

² Op. cit., p. 172.

³ *Psychology of Babyhood*, p. 136.

No doubt the ready help of the mother leads to many possible true onomatopoeic words being anticipated or at least helped by her. But it seems highly probable that some direct imitations of animals and other sounds and their subsequent spontaneous use as indicators do occur. (Dearborn noted this also in the case of wind, engines and water):¹ and this is very suggestive as one of the ways in which speech may have begun in primitive man. It has indeed been called the 'Bow-wow' theory by Max Müller.

Gesture language. I have already mentioned that only one or two examples of true gesture language appeared in B or Y before the age of 1;0. It is well known that an elaborate gesture language is evolved as a substitute for speech by the deaf mutes. An experienced teacher of deaf children tells me that the learning of lip reading and attempts at speech by deaf children are delayed if gestures are allowed to be continued. There are also records of infants who continued much gesture language because of slowness in acquiring speech—possibly because of slow maturing of the necessary mechanism—possibly because of laziness.² In the latter case they might be continued so long as those around them respond satisfactorily, just as 'baby talk', unintelligible to others, may continue if the mother responds to it and even imitates it, as we shall see later. Among the Dionne Quintuplets, gestures were 'remarkably expressive and fairly common', and these children were very retarded in actual speech.³ There is also considerable evidence of retardation in the growth of speech in twins.⁴ The reason in both cases is no doubt that the child, playing constantly with another at the same level of development, finds that gestures are largely adequate for his immediate needs, and he tends to have less of the stimulus of the speech of adults or older children.

Now both B and Y seemed eager to learn to speak, and they were constantly either with adults or older children and were strongly imitative. They understood some words earlier than the average child: by the age of about 1;0 or 1;2 they both understood a number of words and spoke one or two. Gestures, how-

¹ Op. cit., p. 178.

² Stern asserts the latter: see *Psychology of Early Childhood*, p. 145. Examples are also given by Sully, *Studies of Childhood*, p. 139.

³ See *Collected Studies on the Dionne Quintuplets* by W. E. Blatz and others, Section on Spoken Language, p. 12. It should be added, however, that the Quintuplets had a bilingual environment.

⁴ See 'The Development of Language in Twins', by E. J. Day, *Child Development*, III, 1932; also E. A. Davis, *The Development of Linguistic Skill in Twins, Singletons and Only Children from age Five to Ten Years* (Univ. of Minnesota Press, 1937). Miss Davis found that at these ages twins were especially retarded in articulation. See her summary of results, p. 137.

ever, continued to appear for a considerable period, especially when language failed, as we shall see directly. The main point that appears clear is that with adults round him to encourage and instruct him, *an intelligent child may begin, through imitation, to use spoken language as soon as he is able to invent significant gestures on his own account.*

I quote some records of gestures and possible gestures after 1; 0.

B, 1; 0½. Seems to ask to be put to bed by putting his thumb in his mouth and putting his own dress or his mother's skirt over his face.
1; 1½. First pointing at interesting objects, and pointing at F in reply to question 'Where's daddy?' (Pointing is a gesture *instead* of language, though not gesture-language proper.)

1; 2. Regular pointing at things he wants. (The first pointing by C was also at 1; 1 and 1; 2. It was very frequent at 1; 3.) B, 1; 3½. Shakes his head if we say 'No, no.' 1; 4½. Shakes his head as well as saying *gö(ne)* when something has gone.

1; 4. Sniffs at the sight of flowers.

In a railway carriage, a lively baby of 1; 2, whose nose had just been wiped by her mother, took the handkerchief and offered it to me, a complete stranger, while making sniffing noises. Later she did the same to the ticket-collector. These last three notes exemplify the way in which a natural action may become a symbol. For the shaking of the head has its early counterpart in the turning away of the head from the breast or bottle when replete.

My next note shows the alternating of a half-learned word and a gesture.

B, 1; 4. Said 'a-g-i' for 'again' to-day, twice; then dropped back to 'ge'. Wanted me to repeat ticklings and slowly pouncing on him. After two or three tries with 'agi' he did not speak, but put up his hands and twiddled thumbs and fingers, just as he used to do to call the birds.

Sometimes a gesture may accompany the spoken word: thus:

E. W., 1; 2. Sometimes says 'wound and wound' (round), making rotational movements with the hand.

B, 1; 5. Now points to things which interest him, e.g. trains, dogs, and makes their characteristic noises. (Y did the same thing at 1; 4.)

B, 1; 5. Head shaken when refusing something—accompanied by cries. (So A in the same month and C at 1; 4.) Imitates hammering when he wants the harmonica.

1; 8. At bath-time tugs his hair and gives a questioning grunt to know if he is to have his hair washed.

So gestures continue at this age to be used when the idea is clearly present but before the appropriate language is known or at least used with facility.

This section may well be concluded by a record of a child who

at 2; 11 was only at the usual level of 1; 6 for speech. She had a nurse whose interest was entirely absorbed by the child, would not let her feed herself, &c., interpreted at once every gesture and articulation. The child showed vivid gesture language. There was no evidence of lack of general intelligence, and when the environment was changed and her gestures were not responded to, she developed speech nearly to normal level by 3; 4, and by 5; 0 was 'definitely superior'.¹

Speech imitation in the second year. The onomatopoeic words were obviously dependent on imitation (either of the animal or of ourselves imitating it) and heralded a very active period of attempts to imitate our own spoken words.

Y, 1; 4½. Will try to repeat anything we say.

B, 1; 4 (d. 496). Tried to make him say 'please' for something he greatly wanted. He seemed to try hard, but only managed to say 'pf' or 'booa'. *It is notable that he gets consonants in imitating but not vowels*: e.g. 'pf' for please, and 'go-go' for 'again'.

B at 1; 4½ showed great willingness to imitate in pronunciation experiments. Among 15 sounds spoken to him he only failed to attempt two.

In view of the interest in the interchange or mispronunciation of different consonants and vowels, both among speech defectives and in the development of modern languages, it is desirable that systematic experiments should be tried with different speech sounds instead of relying, as is usual, on occasional observations. These attempts at imitation at this early age are especially instructive because the inaccuracies and substitutions must depend almost exclusively on the natural tendencies of the speech-organs, and are scarcely influenced by sounds that have become habitual. I therefore give details of this experiment in imitation.

Sound-Imitation Experiment at 1; 4½

All sounds pronounced by C. W. V. with vowel sound as in *cow*

B's attempts adjoined

bow	baa	now	m, with lips closed
cow	gě	now	awă
dow	dŭ (between dă and dow)	ow	(no response)
fow	refused; later shook head	pow	bă
gow	gě	quow	? some attempt
how	breathed roughly, almost H sound	wow	wow:wa
jow	gě	vow	vow-wě (v or b). No reply at first, but B made attempt at once when I held out yellow pencil as a reward
low	no success		

¹ A. Gesell (and others), *Biographies of Child Development*, p. 143 (London, 1939).

It may be noticed that in these responses 'k' (in cow) becomes 'g', and 'p' becomes 'b', as it did again when the experiment was repeated at 1;9½ (p. 404). No attempt is made at fricatives or semi-fricatives, 'f' and 'l'; nor was the attempt made in the later experiment at 1;9½.¹ Y, however, at 1;3½, to 'kok-kok' responded 'tok-tok': and to 'buz-buz' gave 'bü-bü'; she also gave recognizable imitations of three family names.

It was very clear at this stage in both B and Y that there were often efforts to imitate difficult words—combinations of sounds which they had probably not uttered spontaneously as combinations. It is unnecessary to say how much willingness to imitate helps the acquisition of speech. This imitation tendency remained strong even at later stages: thus Y would imitate phrases she could not understand as late as 2;6, or even 3;0.

Readiness to imitate, no doubt, is partly dependent on capacity to speak, but it is by no means parallel. Indeed, one of my friend's contributions of notes on speech emphasized the coincidence in her daughter at 1;6 of constant chattering with a marked absence of any tendency to imitate.² Mr. H. P. Williamson, who also noted 'vigorous attempts to imitate' during the period 1;0-1;6, made the interesting observation that E. W. (at 1;2) 'imitates unfamiliar sounds more readily than familiar ones already included in her vocabulary': again, I suggest because these familiar ones *meant* something which was not suited to the moment.

That these imitations are not always mere parrot-like repetitions is indicated by a strange note on

Y at 1;9. Tried to get her to say 'coffee'. Several times she responded with 'foffee', the third time with signs of some annoyance. Then to my next reply of 'No! Coffee' she suddenly and emphatically cried 'Tea!' The same thing happened a day or two later.

Constant 'playing' with or 'practising' new sounds. This continued during the second year, thus greatly increasing the value of imitation.

Y, 1;0½. Frequent 'talking' to us. 1;1½. Heard practising 'ta' (just learnt) alone. 1;4½. Great activity in saying a new word learnt or a word heard; e.g. M says she is going to have a bath.—Y: 'Ba-ba-ba.'

¹ The substitutions noted by himself and various other observers (mostly at a later age) are summarized by M. M. Lewis in his book, *Infant Speech*, Appendix III. It is of interest to compare also the errors of speech-defectives as given by Burt in his *Backward Child*, Appendix IV.

² Yerkes remarks on the almost entire absence of imitation of speech among his apes: only occasionally lip movements were apparently made in imitation of the experimenter, and rarely as if by accident, a sound would appear: see *Chimpanzee Intelligence*, p. 55.

'You're going to the park.'—'Par-k, par-k, par-k.' Several times I have heard her say 'door' as she goes to the door to open it.

Y, 1; 5. Sees me. Says 'Daddy' five or six times, sometimes pointing. M talking to me (Y playing) says something about a book. Y inserts into her prattle 'Book, book, book.' 1; 5. 'Constant babblings.'

This babbling continues over a considerable period; at least till 1; 7 with B (though getting less frequent) and with Y as late as

2; 3. repeated babbling of 'nonsense syllables' when alone in cot, or to us, occasionally introducing a new word.

F. Lorimer made a shorthand record of the chatter of his girl Diane at 1; 9. Out of 117 syllables, 87 were meaningless even to the mother.¹

Great extension of passive vocabulary. This constitutes perhaps the chief advance in the second year.

B, 1; 4. Understanding of words and phrases seems to have increased considerably during the last few weeks. 1; 5. Developed greatly in last few weeks in understanding language but very little in speaking.

Similarly it was noted that Y's understanding of words increased, with little increase of speaking, at 1; 4 and 1; 5. Stern also notes the great advance of understanding over speech in this period.²

This advance of understanding may extend now to two words: thus, Y at 1; 3½ understands two words put together, though learned separately: e.g. if I say 'Smack S'—she goes across room and smacks S. This was ahead of saying two words, which occurred first at 1; 4¾.

The relation between learning to speak and learning to understand is a complex one, and seems to vary considerably in different children. The eager imitativeness of B and Y was a link between the two: but some independence of the two processes is illustrated by the fact that sometimes the child uses a different word from the adult word, though he understands the latter. Further there are some unusual cases on record where a child spoke practically nothing until the age of 2; 0 or more, though he understood a great deal, and then suddenly began to speak quite well. Delacroix reports that a child known to him did not begin to speak till about 2; 0 and then uttered the complete phrase, 'Suzanne pas polie'.³

The apparent generalization of words. We have already seen how B's use of the word 'Dada' seemed at first sight to spread

¹ *The Growth of Reason*, p. 61 (London, 1929).

² *Die Kindersprache*, p. 20.

³ *Le Langage et la Pensée*, p. 334. It is interesting to recall that in one kind of aphasia the patient can point out an object named, but cannot tell you its name.

from being applied to the father and became applied to toys, or a 'play-situation': just as X's use of 'Billie' spread from use with her brother, to play and games. Then we saw that we may have been wrong as to the child's first meaning and that 'Dada' and 'Billie' were probably *from the start* expressions of the feeling specially roused by those individuals.

Early in the second year, however, generalization of words occur which can hardly be explained in the above way. The cognitive element now becomes prominent. Thus:

B, 1; 6. Pinafore with birds on was called Ku-kuk—the name for birds. Later a pinafore without any birds on it was called Ku-kuk.

E. W. Even as early as 0; 11 began to say 'dod' (which she had learned to say at 0; 9 at the sight or sound of a dog) when she saw 'any small living creature such as a fowl, sheep, etc.'

Before I give other and earlier illustrations, I wish to suggest that all these early words are only very lightly attached to their 'objects' or feelings, and that, with a strong tendency to say *something*, a slight resemblance—either between objects or feelings roused, sets this tendency off. Hence, as Stern says, the use of the word 'fluctuates'.¹ This idea makes more comprehensible the strange 'spreads' illustrated in some of the following notes.

B, 1; 2. Having often seen pictures of dogs and barked at them, B now barks at pictures other than those of dogs.

E. W., 1; 3. Uses the word 'door' to indicate taps, as well as doors and gates.

B, 1; 5. Says 'Bow-wow' to pictures of rabbits. Also says 'Ba' (baa-lamb) to cows. Yet B would readily change 'Ba' to 'Moo' when told.

B, 1; 5. Pointed to a print of a clean-shaven man and said 'Dada'. 1; 6. Calls pictures of women as well as men 'Dada': even pictures of statuary: of course recognition (implicit) of similarity does not mean that differences are not also recognized, and as clearly. 1; 7. Pictures of bearded men and one of a woman in evening dress elicited the cry of 'Dada'.

The generalization of words illustrated on p. 394 is exemplified also by Stern and several other observers. It is often accompanied or followed by a specialization of the word to its 'correct' use, as we shall see shortly. But first it may be emphasized that when a name spreads to new objects the common element in the two objects need not be analysed out or thought of separately: just

¹ *Die Kindersprache*, p. 233. This section of Stern's book gives an admirable discussion of the development of word meanings. I agree with F. Lorimer (in *The Growth of Reason*) that during the earliest usage of any word there may be mere 'babbling' of the word at times: cf. the use of Waw-waw given by Lorimer (p. 59).

Other examples of generalizations

	<i>First application</i>	<i>Later applications</i>	
B, 1; 7			
Ga-ga (grandpa)	Grandfather's photograph	C. W. V.'s photograph	Pictures of men
Dickie	Sparrows	All birds	Flies, spiders, bits of fluff floating in the air
1; 8			
Gö(ne)	Spoken when object disappeared or food finished	Spoken when he has had enough food, pushing the rest away	

as in adults a vague feeling of familiarity on seeing a man A brings the thought of B, though for a time we cannot say how they resembled one another.¹

Some apparent generalizations are probably not such. As with 'Dada' when first used by B they express from the first some wider meaning than the adult attaches to the word; thus:

X at 1; 8. 'Ot' is used not merely for 'hot' but for very 'cold' or even, perhaps, 'very unpleasant': e.g. at the sight of a strange dog X got behind M and said 'Ot, 'Ot.' Also spoken if food is very cold.

So when E. W. learned to call her (bearded) grandfather's portrait 'Bampa', and later used it for all pictures of men with beards, there is no genuine transference, but the repeated naming of a 'portrait of man with beard'. The same seems to apply to E. W.'s calling pictures of women 'Edith'—her mother's name.

An interesting transference occurred at

2; 1. We said when B had a cut on the hand: 'Poor B.' Then he would say it when looking at the hand himself. Later a cut even when on his father's hand was called 'Poor B.' But a few days later he corrected himself, saying: 'Daddy got poor B. . . . No. . . . "Poor".' Here we see the analysis in process.

E. W. at 1; 9 (who had often heard herself called a 'good girl'), apparently wishing to express her approbation of something that her father had done, said 'Daddy good girl.' But here 'good girl' is evidently not the expression of the two ideas 'good' and 'girl'.

There would seem to be several possible processes which are apt to be called 'generalization'.

First and simplest there is the use of an apparent name (e.g. Dada) which is really an expression of feeling and so may be used for toys or games, as with B. This is probably for most children the first to occur. The second is the wider use of a word which

¹ L. T. Hobhouse, *Mind in Evolution*, Chap. XIV, § 6, on the way in which similarity may be 'operative' without 'explicit comparison' (p. 332).

has only a vague meaning for the child, for a wider group of objects which resemble one another in a general way, or, as we might say, have the same general form or Gestalt. The distinctions are not clearly made in the child's mind: as when a baby says 'Daddy' to various men at a distance at which he cannot distinguish the man from the father though adults can easily do so.

The third is exemplified by B's extension of the word 'dickie' from birds to flies and finally to bits of fluff floating in the air. Here I think the child has, after a time, fixed (though not explicitly) on a certain quality—'flying about'—as the interesting thing about the bird, and so the term is applicable to flies and, later, bits of fluff. Consider also the following:

B, 1; 8. Says 'gone' now when he has had enough food, pushing the rest away. At first 'gone' was only used when an object had disappeared (the word *gö(ne)* being accompanied at 1; 4½ by a shake of the head)—and then when all the food was finished.

Here again it would seem that an element of similarity in two situations was enough to affect a transfer of the word: and sometimes a word may be transferred from one class of things to another and then to a very different one—with, however, one common quality, as Stern has pointed out.

This same month (B, 1; 8), when I said 'Look at the fly,' he turned round till he found one, pointed to it and said 'Dick-kee.' Similarly when I said 'Where's pussy?' he would look and speak his name for cat, 'chower'. Mrs. Moore says that her boy called cats 'bird', and if he heard anyone say 'Cat, cat,' he looked about for the cat, but exclaimed 'Bird, bird.'¹

This fact—the use of one word for another understood—may be significant of the child's own part in building up his own speech: but possibly it is no more than an example of an earlier learned word (even if it be mislearned, as in Moore's case), persisting in use even when a new name is now understood. We get this on a broad scale, of course, when the slum child, with a marked local accent, learns to understand perfectly the cultured speech of a teacher, but, continues largely to use his own almost unrecognizable pronunciation of the same words.

Advances from 1; 6 to 2; 0. Seeing that both B and Y and also E. W. were somewhat precocious in speech (B and Y and probably E. W. having I.Q.s of about 140, the events mentioned in this section will occur generally in the period 1; 9 to 2; 3 or 2; 6 for the average child.

Using two words together. This was the most notable advance about 1; 6. I refer to something more than the conjunction of

¹ Op. cit., p. 123.

two *names* (if that ever occurred), namely, the clear appearance of a subject and predicate—a definite sentence. No doubt the earlier spoken single words really expressed a thought which was more than an object or person. When a baby cries 'Mama'—it may express something which more nearly corresponds to 'Mama, come here'.¹ But we have clear proof that such thought is occurring in some uses of two words at this time. We find B's first two-word sentences, 'Dadda gone', at 1; 8½ preceded by the use of 'go' (gone) alone at 1; 5¾, spoken when something had disappeared. The following notes show the stages in B's case.

1; 5. B imitates two words spoken together, 'Ta, Dadda,' but does not so far spontaneously use two words together. 1; 6½ (d. 572). Tried to teach him 'Dickies gone.' B 'Go—(pause)—dickie'; always in this order. Why this order? Is it to speak the more difficult unfamiliar word first? d. 589. I failed to get 'train—gone' repeated as two words. When I said 'Ch-ch gone' I once got 'Ch-ch,' then an interval of three or four seconds; then 'Gö.'

1; 8½ (d. 620). 'Daddy gone' reported by M as certain. d. 634. When he saw Annie go to drawer where spoons kept, B said 'Ayie' poon.' M passed F something at breakfast which F took without speaking. B said 'Daddy ta.' 1; 9 (d. 637). Says both 'Daddy gö' and 'Gö Daddy.' Interval between words at first marked; by d. 660 definitely quicker. d. 641. Puts two words together often now; e.g. 'Maba' poon,' 'Daddy gone,' &c.

d. 652. In response to my question 'Whose hat?' (holding my hat) B said 'Daddy hat.' This is perhaps the first possessive use of word, 30 days after 'Daddy gö.' d. 653. When I was getting him a cake he repeated, about a dozen times, 'Daddy—cakey': apparently meaning 'Daddy get cakey.' d. 653. B constantly practising this use of two words: 'Daddy,' 'Mummy hat,' &c., pointing to the objects as he mentioned them. So d. 657 and d. 669 with new pairs.

How intensely the mind was occupied by these new activities is suggested by a note on B, d. 657. When awakened suddenly at night, he looked up with a sweet smile and said '(h)'at.'

'Daddy gone' was also X's first two-word usage at 1; 8. Y was somewhat earlier than any of the children in using two words, and the conjunction of noun and possessive came first among two-word constructions: thus Y, 1; 4¾ (d. 508). 'Mamma—tata' said to M's coat which she wears when taking Y out.

Y, indeed, achieved a three-word sentence earlier than B's two words.

Y, 1; 5½. 'S o'(pen) door' (waiting for S to open door for her). 1; 6. Reported by M that after S₁ smacked S₂, Y said 'S₁ mk-mk S₂.'

¹ Several psychologists hold that the word-sentence comes before the simple word. (See Piaget, *Language and Thought of the Child*, p. 133).

(Smacking noise in between. Here we have a combination of two words plus an onomatopoeic sound.) 1; 6½. 'Bo(ttle) aw go' (reported by M). M 'Where's bokky?' Y 'Aw go.'

Stern's son was very precocious in beginning to put two words together at 1; 2. But Stern notes 'stagnation' for a few months after. Stern's daughter used two words together 'Tag mama,' 'Look-daddy' at 1; 7 and 1; 8. The conjunction of substantive ideas appeared at 1; 9—'Mama—hat' (Mama put hat on).¹

Gesell gives 'putting two words together' as a hard test for 1; 6: he marks it A+ (i.e. it is done by less than one-fifth of the children tested at that age and probably some of these were reported only by mothers). At 2; 0 it is accomplished by about 75%.² Saying five or more different words 'is a test marked B for the age 1; 6', i.e. it is done by about 75% of the children tested. Both my own records, however, and Stern's, suggest that far more words are said before two words are used. The number of individual words learned will, of course, greatly depend on instruction and encouragement; but this cannot affect so vitally, if at all, the maturing of the ability to combine two words.

There is often uncertainty as to whether two words do not express merely one idea; e.g. in 'Bokky aw go,' spoken by Y at 1; 6½, 'aw go' may mean simply 'gone'. Sometimes, however, the situation may make it impossible that the two words should stand for only one idea, as with most examples given above for B and Y, e.g. Daddy gone, Mummy hat, &c.

A clear case of three words involving separate ideas is the *first use of three words* by

B, 1; 10½ (d. 681). M. 'Say you're Mummy's boy.' C. 'Say you're daddy's boy.' B. 'Daddy-maba boy.' (He promises to be a diplomatist if not a linguist!)

A prolonged pause between the words is also, I think, a good indicator of a distinction in thought. Thus B, 1; 11. 'Ta-maba (long pause) . . . dear.' 'Maba . . . go . . . dere.'

A long pause between the words at this stage of using two words together was also noted by Stern³ and by D. R. Major at 2; 0⁴ and by Mrs. Fenton at 1; 6.⁵

A more conscious distinction between two concepts seems implied in the use of 'too'.

Y, 1; 8. 'Daddy too' (when she had been given a piece of toffee).

¹ *Die Kindersprache*, pp. 87, 30, 43.

² *Mental Growth of the Pre-School Child*, p. 91.

³ *Psychology of Early Childhood*, p. 164.

⁴ *First Steps in Mental Growth*, p. 324.

⁵ *Practical Psychology of Babyhood*, p. 137.

B, 1; 11½. 'Daddy drink too.'

We may notice how quickly the use of three words comes after the first use of two; with B it was two months later—1; 8½—1; 10½; with Y rather less than two months later—1; 4¾—1; 6½ in the examples given above. Similarly with E. W.: apart from doubtful two-word usages at 1; 2—('goo-girl', and 'here 'tis', which may have meant only 'good' and 'here') the first two-word usage was at 1; 3½—'Dada gone,' and the next month (1; 4½) appeared 'Dada gone school,' often said to visitors. The advance of Preyer's son was even more sudden. The first use of two words was at 1; 11, yet between 2; 0 and 2; 1 the boy used a four- and once even a five-word sentence.¹

By 1; 11 three words were used together fairly often by B, and by 1; 10 by Y, e.g.

Y, 1; 9½. 'Mummy do ee (it)'; at 1; 10½. 'Mummy (h)at floor.'
B, 1; 11. 'Maba go dere.' 'Mummy 'at floor.'

By 1; 11½ appear four words:

B. 'Maba ge(t) more bicks.' Y, 2; 2, now uses five words: 'I know where Daddy is,' 'I got comb like Daddy.'

Again we may comment on the rapid advance from the use of three to the use of four words in one month, contrasted with the long period needed for earlier steps.

In this period of the appearance of two- or three-word sentences we find clear examples of *communication of ideas* by the child: e.g. Y's 'S₁ mk (smack) S₂' and commands—'Maba go dere,' though no doubt many of the single words used months before this were commands or communications. The most remarkable record I know of early communication is that of E. W., who at 1; 5, having broken a bottle, came to her father and spoke thus: 'Oooo' (serious tone) . . . pause . . . 'bokkle' . . . pause . . . 'gone' . . . pause . . . 'bang' . . . pause . . . 'oooo'! (Mr. Williamson noted the long pause, as I did, between words combined at this early stage.)

This early impulse to communicate is not surprising when we remember that the earliest cries have a social value and consequence, and later, some of the first words spoken, e.g. 'Mama', may be appeals for help and then requests to notice.

Other notable advances between 1; 6 and 2; 0

We have now reached a stage when most of the child's speech needs consideration as a development of thought as well as of

¹ *Development of the Intellect*, pp. 151 and 155.

language; but some important facts as to the growth of speech remain to be given here.

First uses of the negative. In the section on gesture language we saw that B at 1;5 shook his head when refusing something. A did so somewhat earlier, though much behind B in language development generally, and C did so at 1;4, though he too was behind B in speech; but the head-shake, as we saw, was a form of natural gesture. Already at 1;3½ B shook his head when we said 'No, no,' and now appears the spoken negative:

B, 1;6. M says he shakes his head and says something like 'Na, na,' when refusing something. No signs of similar use of 'yes'. 1;7 When M rolled him about on the bed he cried 'Na, na,' very emphatically till allowed to sit up. B, 1;10. 'Na' has changed to a clear 'No'.

C, whose head-shake was noted earlier than B's, was also a week ahead of him in saying 'Na-na', which appeared at 1;5¾: but one must bear in mind the possibility of not hearing the very first usage.

The earlier appearances of 'No' than of 'Yes' is notable. At 1;10 I noted 'B does not yet use "yes" correctly': and C even at 2;2 would only nod and say 'Um.' No doubt the difference is due to the fact that acceptance does not require any special gesture and the movements involved vary according to the object accepted; it might be only opening the mouth for food or taking something in the hand; whereas refusal meant at the earliest stage a turning away of the head: and this provides an early nucleus to which the word comes to be attached. Also a greater emotional tinge would accompany many refusals (anger or fear); and further, the more emphatic tone of a refusal by another, especially when the parent must suddenly stop the child from doing something harmful, would help to an earlier understanding: for as we saw in an earlier chapter there seems to be an innate understanding of an angry tone—as indeed I have noted even of a cat treated so gently since birth that it could hardly have learned it by association with punishment.

The first certain questions also appeared during this period with the aid of a gesture.

B at 1;8. In his bath B has several times recently tugged at his hair and made his questioning grunt to know if his hair was to be washed which he hates.

The attitude of questioning or inquiry no doubt had frequently occurred before—the expression on the face suggested that, as did the questioning grunts; but from these it was hard to infer with certainty. There is no doubt about B's question given above. The later dates of most of the examples of questions given by Stern (about 1;9 to 2;0 and over) refer to questions more explicitly

expressed in words—'wheres' and 'whats'.¹ The first question I have noted of B's in actual words was at 2; 0½. As I took him up to bed (to go 'ni-ni') he said in a questioning tone: 'Daddy ni-ni?' But at times the questioning grunt was still used after 2; 0.

Do children invent words? We have already seen that a child may turn a natural expression into a meaningful word: and that he may adopt a word spoken to him, e.g. Dada, to express something quite different from what the adult intends. Further, even efforts to imitate often result in something very different from the model: and these poor imitations may be used for a long time. Some observers, however, go further than that. They assert that children sometimes invent and use words intelligently and force them into usage by others. Thus Taine's child, after making the sound 'Tem' as mere babble for two weeks, began to use it as equivalent to 'give, take, look'.² In spite of its resemblance to 'Tiens', Taine thought it a genuine invention of the child. But the babbled 'Tem' may itself have resulted in the sound 'Tem' being produced in the attempt to imitate 'Tiens'. Darwin says that his child

At 1; 0, made the 'step of inventing a word for food,' namely *Mum*, 'but what led him to it I did not discover'. Now instead of beginning to cry when hungry he used 'Mum' as a demand, and shortly also as a general substantive for food, e.g. 'she-mum' meaning sugar (food).³

Possibly this arose from earlier sounds like 'mum-mum' in noisy sucking or munching; but it is easy to see also that if 'mum' was first the sign for 'mother', the association with food could readily be established. There are other similar examples.

If we pass on for a moment to a somewhat later age we find further evidence of the capacity of some children to produce words which are at least far from copies of the speech they hear around them. Consider the remarkable records of the son of Professor Carl Stumpf. He evolved an early vocabulary of his own, mainly consisting of natural symbols supplemented by a 'few contorted words gathered from his environment'. With these he developed a speech which gave 'the impression of a foreign language'.⁴

Another remarkable example is that of the daughter K of Mrs.

¹ *Die Kindersprache*, p. 213. Stern reports simpler questions at 1; 6, on p. 30.

² See his article in *Revue Philosophique*, Jan. 1876; translation in *Mind*, II, p. 255.

³ See Darwin, 'Biographical Sketch of an Infant', *Mind*, Vol. II, 1877, p. 293.

⁴ See W. Stern in *Psychology of Early Childhood*, p. 153. Also Carl Stumpf, *Eigenartige Sprachliche Entwicklung eines Kindes*.

M. M. Nice.¹ The exceptionally careful and detailed record is called 'A Child who would not Talk'.

At 2;0 she used only four different words, though she expressed herself (and very efficiently) by gestures. The child was of 'normal intelligence', sociable and popular. From about 2;0 onwards she began to use words, some of which were poor imitations of words heard, but others had apparently grown from 'original expressions' and incomprehensible to strangers, thus at 3;0 'At wawa choo-choo' meant 'I (want to put the) dog (to) bed.'

She developed rapidly from 3;2—in the 43rd month adding as many as eight words a day to her vocabulary. This improvement was, however, gradual, whereas Stumpf's son at about the age of 3;3 suddenly one day began to speak good German 'as though', his father says, 'the Holy Ghost had descended upon him'.

Mrs. Moore's son at 1;7 began to give a name to everything he came across; if he did not know the name he invented one. Some of these names were used for several months, some only once or twice. 'Often finding it necessary to have a name, he babbled some jumble of sounds gathered for the occasion.' It is certainly difficult to see any resemblance to conventional words in the examples given, e.g. 'bizz', his own shadow; 'babax', a hinge; 'blebs', a small ledge on the piano.²

I have few records of any entirely invented words being used by my children, and a note on B at 1;11 expressly mentions their absence. But the children frequently invented 'words' in play as Stern himself noted;³ and many such words look more like independent adaptations than failure to imitate—like B's 'chowyer' for Pussy (no doubt based on 'meow') and Y's 'bow' at 2;1 when I drew her a circle and called it an 'O'.

The best example I have of a spontaneous using of an expression sound as a word is the following:

B, 1;10. The other day the tray of his baby-chair got tipped back and we both laughed at the funny chair. To-day the same thing happened to the chair and I did not notice it. B pointed to the chair and said 'Ha-ha chair.' He did not laugh, but used a speaking voice.

An apparently genuine invention by Y appeared at 2;8½ when she put her shoes by S's shoes, which they resembled, and said 'Mine awsho (like) S's.' A further note at nearly 2;10 states

¹ *Pedagogical Seminary*, XXXII, 1925.

² *Mental Development of a Child*, p. 125.

³ *Die Kindersprache*, p. 132. H. Delacroix also records the invention of special words for a regular game including the names of mysterious imaginary weapons. *Le Langage et la Pensée* (2^e ed.), p. 333.

that she still uses 'awsho' for 'like'. But some vague apprehension of the meaning of 'also' may be responsible for this.

Dearborn states that the only 'arbitrary expression of her own made by his daughter at 1; 8 was "aminoo" for "open it", the only resemblance being in the number of syllables',¹ but the last comment is hardly accurate in view of the vowel-consonant pattern and the retained 'n'.

Of course there were spontaneous signs (grunts and gestures) which were sometimes used effectively. Dearborn noted at 1; 4 the invention of a sign by his daughter, namely, putting her finger on the mouth of a person from whom she wished to hear names;² and Stern himself gives examples of the changing of 'natural sound expressions' into genuine speech.³ Born deaf-mutes are said to make sounds to which they attach meaning.⁴ It is probable that invention would be more likely when words were not constantly being suggested by the parents and imitated. Hence it is significant that one of the most striking records of invented words relates to twins. G. J. Romanes gives an account of two (similar) twins who were very devoted to one another and evolved a language of their own, very different from the English spoken around them (e.g. the word for carriage was 'ni-si-boo-a'). Even the usual 'papa' and 'mama' had substitutes. The efforts of a sister five years older failed to get them to speak English.⁵

The beginnings of these invented languages may have all been based upon heard sounds⁶: but the building up of what is largely new language, together with the fact that spontaneous babblings develop into expressions of wishes or even signs of objects, all suggest a *capacity* to invent meaningful words independent of sounds heard and understood.

In general, however, there is no need for such invention. Parents and others are constantly trying to get the children to

¹ Op. cit., p. 174.

² Op. cit., p. 163.

³ *Psychology of Early Childhood*, p. 147.

⁴ Tylor, *Early History of Mankind*, p. 72, quoted by Romanes. *Mental Evolution in Man*, p. 122 (London, 1888).

⁵ Op. cit., p. 139. Romanes also quotes (p. 140) an account of a little girl of 4½ years, backward in speaking, only saying 'papa' and 'mama' at 2; 0, who afterwards began to invent words to speak. She understood words spoken to her but never used them in speaking: and she taught her language to a brother younger by 1½ years, who became bilingual, using special words in speaking to his sister and the correct ones to his mother. (Romanes quotes from Dr. E. R. Hun's report in the *Monthly Jour. of Psych. Medicine*, 1868.)

⁶ I cordially agree with Jespersen's contention that it is absurd to refuse to allow the term 'invention' unless the word is 'produced out of nothing' or if it occurs without deliberate intention to invent. See his *Language: Its Nature, Development and Origin*, p. 153.

imitate their speech: and at times a watchful mother may pick out some babbled sound of the child—repeat it and adopt it as some sign. This latter process indeed may have been one of the ways by which a language would develop, even among the young, when once adults had begun to supplement gesture with vocal signs, first perhaps as mere expressions of feeling or emotions. The parents in the most primitive stages of man's development may have picked out early speech sounds spontaneously made by infants and given them some meaning. Thus the *ma* or *mu* sound seems to be one of the earliest noted by some careful observers. The mothers would naturally tend to fix one of the earliest speech sounds as meaning themselves. This may be a partial explanation of the fact that *ma* or *mu* sounds so often mean 'mother'. The occurrence of the sounds of the word for mother in various European languages is familiar—'mater', 'mutter', 'moder', the Sanskrit being 'Mata'. 'Ma-ma' is said to mean mother in a hundred African dialects.

Words used by B at 1;8. I have no complete record of words and phrases *understood* by B or any of the children at this stage. They were undoubtedly much more numerous than the following which were *spoken* by B at 1;8. This list may not be complete even so far as articulate sounds resembling adult speech were concerned; and certainly there were also various grunts and other sounds made significant by pointing or other gestures. I should emphasize again that the grammatical classification of words used at this stage is very doubtful but I give the list for the sake of comparison with those given by others.

Words used by B at 1;8

<i>Names</i>	<i>Verbs</i>	<i>Adjectives</i>	<i>Other words</i>
Dada (Daddy)	Ta (request)	Gō (gone)	Ta-ta = Good-
Maba (Mamma)	Gi (give—request)	'Ot (hot)	bye
To-to . . . toe-toes			Na-na
Gee-gee			(negative)
Chowē-chowē			
(pussy)			
Osh-osh (train)			
Baw (ball)			
Go-go (Gordon)			
Kuck-kes (chuck-chuck)			
Baa (baa-sheep)			
Mou (moo-cow)			
'at (hat)			
Ai-ee } Annie			
A-de }			
K(g)i (stick)			
Ko (coat)			

Y's vocabulary at 1;8 was more varied and included already 'more' and 'too', e.g. 'Daddy too' when she had a piece of toffee given her.

Imitation test. At 1;9½ another imitation test was done with B: the results were as follows. The vowel sound which I used throughout was again 'ow' as in 'cow'. (The record of the earlier experiment at 1;4½ will be found on p. 390)

C. W. V.	B	C. W. V.	B
Bow	Bow	Now	Dě
Cow	Că	Pow	Baa
Dow	Dă	Qow	Ga
Fow	Ō	Row	Oa(r)
Gow	Gar	Sow	Oa(r)
How	Ō	Tow	Toa(r)
Jow	Oŭ	Vow	Ō
Kow	Kă	Wow	Ō
Low	oa(r)	Xow	Ō
Mow	Mă(n)	Zow	Ō

As usual, he did not attempt S. In a test, a few days later, in imitating the names of the letters of the alphabet (as far as 'L'), B also made no response at first to 'C' (see) and then said 'ee': to 'F' (eff) he responded ě, to 'Gr'—'gee-gee' to 'H' (aitch) only ž, and to 'L' (ell) he replied ě.

I may recall here the attempt to get Y at 1;9 to say the word 'coffee', and how after several failures she finally cried 'Tea'! I do not know whether this was a bit of humour, or whether we can take it as another example of the way that meaning and thought may enter in when we think we are dealing with mechanical imitation.

The realization that things have names. Stern calls the 'discovery that everything has a name' a 'real and perhaps the child's first, general thought': and he places it in the period 1;6 to 2;0. One symptom he gives is the sudden increase in vocabulary, which does not seem to me to be any proof of such a generalization.¹ A more significant sign, I think, was shown by Mrs. Moore's boy at 1;7½ when he 'began to give a name to each object with which he came into contact', inventing one if necessary.² The other, more reliable, sign suggested by Stern is the sudden inquiry as to the names of things. Even this, I think, may take place within limited sphere, without a wider generalization. Thus

B at 1;10 had a set of bricks with pictures of different animals on each. We taught him the names of some of these. At 1;11 a great desire to learn all the names appeared, B constantly holding up a brick with a

¹ *Psychology of Early Childhood*, p. 162.

² *Mental Development of a Child*, p. 125.

questioning grunt, until finally he could pick out correctly at my request even the Ibex, the Elk and the Reindeer.

Here, I think, the obvious resemblance between the bricks might suggest in each successive case the idea of a name for it. Twenty days later, however, appears the note :

B, 1 ; 11 $\frac{3}{4}$. Always wants to know the names of things now : seems just to have discovered that they have names and is continually pointing at various things, and making a questioning grunt to us.

Later the questioning grunt was replaced by 'What dat?' : and even six months later the passion for learning names had not ceased, for, no doubt after periods of quiescence, I find the note : B 2 ; 6 $\frac{1}{2}$. The last few weeks B has constantly been asking 'What (is) that?'

With Y the first step in the process may have been at 1 ; 8 when she was 'constantly practising naming things'—'Mummy hat', 'Daddy chair', &c. At 2 ; 1 $\frac{1}{2}$ Y was constantly asking 'What this for?' I thought it might really be a request for the name, but it soon became clear it was not, for she asked about things of which she knew the name well, e.g. 'What doggy for?' 'What pussy for?' This surely is as good a sign of a generalization as the repeated questions 'What's that?' So she can 'generalize' in some sense. Yet I noted that by 2 ; 3 I had not noticed yet a period in which 'What's that?' appeared frequently. With Y it may have come more gradually or her great imitativeness may have led to her getting quite enough material to keep her busy. I did notice, however, that at 2 ; 4 she several times asked, 'What's that?', pointing to things in a picture S was looking at.

Speech in the third year. Since our children seem to have been somewhat in advance of the recognized norms, the third year with them will correspond rather to the period 2 ; 6 to 3 ; 6 for average children.

The period 2 ; 0 to 2 ; 6. Perhaps the increased use of words other than nouns was the main characteristic of the period around 2 ; 0 and beyond. The classification of words used into grammatical groups—nouns, verbs, adjectives, &c., has been carefully discussed by various writers.¹ Partly for this reason I do not propose to attempt any such listing ; also I think such classification is not very profitable at this early stage when the function of the

¹ See Stern, *Die Kindersprache*, Chap. 15 ; K. C. Moore, *Mental Development of a Child*, Part IV, Section 2 ; D. A. McCarthy, *Language and Development of the Pre-School Child*, Chap. 6 ; and for somewhat later ages, J. Drever, 'A Study of Children's Vocabularies' (on children of 2 ; 4, 3 ; 7 and 4 ; 6), *Four. of Exper. Ped.*, Vol. III.

word is often doubtful, and when so many words may be parrot-like imitations of what is heard, without a corresponding meaning. We shall, therefore, confine our study of this period largely to usages which are unlike those heard around, to signs of the growth of new functions, and to brief indications of the development of thinking which will be dealt with more fully in the next chapter.

Difficulties of grammatical classification. It is generally agreed that, at the earliest stages, one word spoken by the child may function as a whole sentence; e.g. 'Mummy' for 'Mummy come here', 'Milk' for 'I want some milk', and so on. The earliest use by the child of words which in adult language are *adjectives*, also illustrates well what I have said about the danger of grammatical classification at this stage. As we have seen, the adjective at first seems to be very closely blended with the noun: as when B said of my sore finger, 'Daddy got poor B—No! *poor*.' (B here stands as usual for the boy's own name.) Indeed, an adjective may function as a noun. Thus B had been taught to say 'Good' after various kinds of food and sweets: then at 1;9 he would point to the place toffee was kept and say 'Goo(d).'

By 1;10 at least B was using adjectives with a noun, e.g. 'Goo(d) cakey'; but some I think were not really understood: e.g. 'Ta, Maba . . . dear.' This may have been a mere formula. At 1;11 he often asked for 'more': but who can say that it did not mean 'again'?

In the same month he learned to say 'pickby' (pretty) first when looking at pictures; then he applied it to the new Christmas decorations: and finally at exactly 2;0 he spontaneously cried 'Pickby' when the sun suddenly burst out of a dark sky. These may have been for him merely expressions of feeling; but the last two suggest that the responses had something of a common characteristic of an aesthetic type, the basis at least for an adjective applicable to pretty things.

In the sentence, for example, 'Daddy got poor B', the words 'poor B', and later the word 'poor' alone, stood for a wound or sore place; and though for some months B had correctly used the word 'chair', yet at 2;0½ 'to sit' is always expressed by '(s)it chair', even when no chair is involved; e.g. 'Maba 'it chair gee-gee.' So in B's remark at 1;11½ as he ran round the room, 'Baby run fast', we cannot be sure that 'fast' is used as an adverb, or whether 'run-fast' is not rather functioning as one word referring to the special kind of running—just as primitive peoples may have a special word for man-walking and another for man-running.

We can, however, draw fairly probable conclusions in this way. Take the phrases 'Dadda-gone', 'Mabba gone'; Dada is known by now to mean Father; for it is constantly used when he appears

and as a means of calling his aid or attention. So with 'Mabba' for Mother. 'Gone' is used not only when the father or mother goes out of the room, but when food is taken away or finished. Hence the conjunction of the terms 'Dadda gone' is likely to mean a conjunction of the two ideas.

Even in some similar cases, however, we have to remember that the same word may mean very different things when used in different contexts—as indeed it may in adult language. Also for a long time the child's use of a word may so fit in with the context that we think that its meaning is the same as ours, till we realize that another meaning does equally well. Thus for a long time M had used 'ki-ki' for 'dirty', and Y had imitated her, so M thought that Y had understood it. But at 1;8 Y would not give up my clean silvery shaving-soap box. When persuaded to, she said 'Ki-ki': so for her the word may mean 'something to be avoided'. Two weeks later she used it when tidying up the floor.

Nevertheless, we have to bear in mind that speaking the language is gradually learned by using words in their right setting even if at first the child's thought does not entirely resemble the adult's: and so early can surprising uses occur which are almost certainly correct, that we must not be too sceptical as to the right meaning of others. For example, Y's use of 'too' at 1;8 suggests a real understanding of it: 'Daddy too' she said (when she herself had had a piece of toffee), and she was only satisfied when I took some; and so with 'Daddy more' when she finished her own piece.

Adverbs of time and place can be placed in this period with considerable certainty. Some beginnings of a grasp of temporal relations is indicated by the appropriate use at 2;0 of a past tense, e.g. 'Baba be(en) ni-ni.' So we should expect that the temporal adverbs might also appear: and we find 'Now' used correctly by B at 2;0. After being put off by a promise of cake 'bye and bye' he would finally say with emphasis, 'Now cake.' Also

B, 2;4. Uses 'now' with great emphasis lately; when I say 'bye-and-bye' he says 'Not bye-bye!' 'Now!'.

Y at 2;0 $\frac{3}{4}$ uses the adverbial phrase '(Thi)'s afternoon' as her first temporal word. The same month she was reported to me as saying, 'I coming soon.'

B, 2;1, often uses 'dere' (there) appropriately, often with a gesture; also phrases such as 'sit by Maba' appeared at 2;2.

Many *questions* were appropriately answered just before and after 2;0: but it is uncertain whether this was dependent on the form of the words or the intonation. In some cases, e.g. 'What colour is this?' one would expect little or no peculiar intonation. 'Yes' began to be used correctly by B just after 2;0, after several

weeks' effort to teach him and after his seeming to understand it since 1; 8. By 2; 3 'yes' was used in reply to many questions and even to reaffirm his statements, e.g. 'at Daddy's book'; when I said 'No,' B replied 'Yes.' Again the difference of tone and emphasis between 'yes' and 'no' may have helped in the early stages.

B himself, however, long used *intonation* to express the question: for example, we could easily tell that 'Daddy go ni-ni?' was a question and not a command. At 2; 5 he would ask 'Where Mammy?' 'Where pussy?' &c. This I fancy was the first question form used, the next being at 2; 6, when he was constantly asking 'What (is) dat?' It is notable that the first question words used are used when a questioning intonation would hardly suffice: where it does suffice it remains longer in use, as with gestures. At 2; 7 B began to use 'Why?'

Y was earlier (as usual) in her use of question words or form. At 2; 1, as we saw, she was constantly asking, 'What this for?', but before this at 2; 0 $\frac{3}{4}$ she would ask 'What [are you] doing, Mummy?', at 2; 4, 'What's that?', and at 2; 5, 'Whose that hanky?' At 2; 7 I tried to see if she would say 'Why?' yet. When we were perfectly good friends I said, 'I think I shall smack Y.'—'No, daddy,'—'Yes, I must smack Y,'—'What to do?' Yet she must often have heard 'What for?' (which was actually used a week later). Again we see the child's own mind devising a phrase to express an idea. Perhaps through 'what for' taking the place of 'why', Y's use of 'why' was actually later than B's use of 'why', though in other question words Y was several months ahead.

Constructive work by the child. A curious thing about this stage is that *the order of words in a child's sentence* is often different from the conventional order which he hears around him, and it may vary within his own sentences. This suggests some independence of sentence formation and that the unit of language is not in any mechanical sense the sentence. No doubt the child does learn much by taking over whole sentences from the speech of others, using them in contexts sometimes suitable and sometimes not, and so gradually analysing these sentences into their component parts and getting a clearer idea of the meaning of each. This process may be a frequent one: but there are also signs of a more independent building up of sentences.

Even before this period a child may show some independence in the order of words in a sentence. Thus B at 1; 6 when I said 'Gee-gee gone'—replied 'Go(ne) gee': and at 1; 7 he sometimes said 'Go(ne) Daddy' and sometimes 'Daddy go(ne).' Stern's child at 1; 8 $\frac{1}{2}$ asked 'Apfe wo?' (Apple where).¹

¹ *Die Kindersprache*, p. 44.

Coming again to the period after 2;0, the negative often has a more important place in the sentence than adults give it: for example, B at 2;1 said 'No, Daddy go ni-ni.' Major also noted the 'No' at the beginning of a sentence both with a command—'No wash' (my face) at 2;6, and, with an assertion, 'No, John walk bit now' (J cannot walk a bit) at 2;10.¹ Stern gives examples of 'no' at the end of a sentence, e.g. at 1;6 'Mama beat, no!'² Sully records early in the third year 'N go in water, no!'³

At 2;6 B would sometimes say 'I *not* will' and at other times 'I will not.' Transpositions were sometimes invariable; and if not that, they were far too frequent to be compared to slips made by adults, though 'slips' do also occur perhaps more frequently with children; for example, B made his first quasi-Spoonerism at 1;10½, when, for 'Daddy ni-ni' he said 'Naddie di-ni.'

My colleague, Mr. J. F. Waterhouse, reported that at 2;3 his boy, J. C. G., 'had been for several weeks energetically experimenting with the building of his word-stock (nouns, verbs, adverbs, &c.) into sentences of varying arrangements, for example, 'Coming Daddy soon back?' 'More see Mrs. F.' (I want to stay longer with Mrs. F.).

The child's own contribution is also indicated by such things as Y's first use of pronouns; for example, at 2;0¾ when washing herself she said, 'Wash Y . . . me' (emphasized), which could not, of course, be a repetition of any phrase heard: and again at 2;1, 'Daddy give Y pear me.' The proper use of the pronouns *I*, *me* and *you* is indeed itself evidence of the child's own activity of thought. By mechanized association 'I' would mean the mother or other person who used the pronoun: and 'you' the child himself, as Sully points out. One indeed of my boys did at an early stage repeat '*you* have it', meaning himself apparently as he took it.

A third sign of independent activity is the *invention of forms by analogy*. Well-known examples at a later stage are the use of weak verb-endings for strong verbs, e.g. 'I thinked', 'I bringed'. But as early as 2;0 B, having learned 'Baba be(en) ni-ni' said 'Daddy be(en) s(h)ave' for 'Daddy has shaved'; and X at 2;3 said 'Baby wants she's knife'—though she can never have heard 'she's'.

The elder girl at 2;3 had picked up a little of the Belfast accent of the maid, including the ä sound for ě. I noted that when she heard me use the word 'editor', which she is extremely unlikely

¹ *First Steps in Mental Growth*, pp. 312 and 313. Major also noted the variation of order of words within the sentence, see p. 324.

² *Psychology of Early Childhood*, p. 167.

³ *Studies of Childhood*, p. 174.

to have heard spoken by the maid, she repeated it as 'äditor'. This is a transference which seems to involve a regular association of ä spoken with an ë sound heard.

A fourth and perhaps the commonest example of individual activity at this stage is the application of known words to unexpected situations by analogy. A good example is given me by Mr. Waterhouse :

J. C. G.'s father each evening renews the water supply of his house by means of a rotary pump in his study. J. C. G. W. (2 ; 1) became very interested in this process (saying 'Daddy pumpie') and immediately began to transfer the new verb to other swinging activities : e.g. on observing some rambler roses swaying in the breeze outside the dining-room window, he announced 'Roses pumpie.'

A fourth thing which the child does for himself at this stage is the putting together of *complex sentences* : thus, B, 2 ; 1, 'Maba (s)ee Daddy do dar-do (dumb bells)'; 'Daddy (s)ee B go(t) toa(st).'

Again we see a remarkable advance in 2½ months, for it was only at 1 ; 10½ that B first used a simple sentence with three words.

X and Y also mastered the complex sentence in this period : Thus Y, 2 ; 3. 'I know where Daddy is'; 'I got comb like Daddy.'

X, 2 ; 5. 'I'll ask Daddy draw other pussy cats 'cos I flew (threw) those pussy cats away.'

B, 2 ; 5, used a conditional sentence. I said he could not go to see G's mummy because it was wet. B replied 'Go (s)ee G's mummy (if) fine', with emphasis on the 'fine'.

The omission of words implied and the first use of prepositions. The omission of the 'if' in B's reply just quoted above is quite in accord with what is happening with other words at this stage : for example, 'and', and various prepositions : e.g. B, 2 ; 2½, 'Daddy gi(ve) spa(de) (and) bubby (bucket).' This omission of a word when some idea or relationship is implied is perhaps best illustrated by the first appearances of prepositions.

Some early sentences evidently imply the grasp of a spatial relation, but omit the preposition. Thus Y, 1 ; 10½, 'Mummy, 'at (on) floor.' B, 2 ; 1, 'B go (on) Daddy knee.' B's first recorded preposition was at 2 ; 1½, when wanting to go into a station he said 'In dere,'—'Dere' he had often used alone. At 2 ; 2 when told, 'Put paper in drawer' he tried and said, 'No go in.' The first use of a preposition with a noun was a few days later, 'Sit by Mama.' At 2 ; 2½ 'Put penny in box' was said. Now he had often been told 'Put the penny in the box' and had no doubt often heard 'Come and sit by mother.' At this transition stage it seems that prepositions were used in certain specifically learned con-

nexions and not used in others. This was precisely what happened with pronouns. Thus I noted

B, 2; 1. Does not yet use any pronouns spontaneously in a sentence he has not been taught: but he says 'What do my chair'? in imitation of our story of the three bears. The same thing applies to the omission of the auxiliary verbs—'is' and 'are'.

Next he becomes conscious of the use of the preposition. Thus

2; 2 (d. 791), B said, 'Pu(t) sand (on) stone.' I said 'Yes, put sand on the stone.' After a minute or so B said 'Pu(t) sand *on* stone,' with some emphasis on the preposition.

Experiments on the use of prepositions. So much has been written on the education of relations as an element in developing intelligence that it is astonishing that no systematic experiments seem to have been made of this in the case of tiny children. It is commonly stated that the earliest relations to be educed or perceived are spatial relations. In ordinary speech these are expressed by prepositions. Hence it seemed natural to discover how far a child's understanding and use of prepositions could be made to provide evidence for his power to educe and differentiate simple spatial relations.

Usually at this stage (2; 2) B omitted prepositions. When he was 2; 2½ I tried to see how soon he could learn prepositions by special training. No striking results were obtained, but I give it as a sample of how a simple experiment may supplement observation.

I placed a card on a box, and as I did so I said to B 'on box'. Then the card was put in the box, I saying 'in box'; and so with 'under', and then all again till each was so used three times. Then I gave these tests.

Test I. Understanding prepositions. B was told to put card 'under', 'in' or 'on' the box, in haphazard order, four times for each preposition. The tests were repeated the next day without further instruction.

RESULTS

Order given	Immediate response	Next day
Put card under box	X I I I	I I
" " in "	I I I I	I I
" " on "	I I I I	I I
I means correct. At X, B put card <i>on</i> the box.		

Test II. Speaking prepositions. I placed a card on the box and asked 'Where's the card' or 'Where is that?'

RESULTS

Test given	Reply	Next day
Card placed on box	On box	On box
" " under box	under "	under "
" " in box	In "	In "

On the second day, half an hour after tests given above, I said :

'Get under the chair.'	B got on it.	'Get in ottoman.'	B got on it.
'Get on ottoman.'	B got on it.	'Get under your bed.'	B got into it.

When he was under the bed I asked : 'Where are you now ?' B. 'On bed.' And so a second later.

It is clear that the understanding is very precarious ; the correct responses to the command 'Put the *card* on the box,' &c. suggest that the learning was specific to '*card* on', '*card* in', &c., the association failing when B himself had to be 'in' or 'on' or 'under'. The number of tests was too small to be sure of this ; it would be worth repeating the experiment on a larger scale.

As to Y, at 2 ; 5½ she used *with* correctly : ('I brush my hair with Daddy brush') and at 2 ; 9½ a test showed correct responses to 'Put dolly *on* the chair', '*under* their chair', '*behind* you' (twice), '*over* you', '*in* pram' ; but 'in front of you' led to putting behind. So Y probably understood at least six prepositions. (Gesell gives three out of five prepositions understood as a fair score at 3 ; 0, and found four or five prepositions known only by less than half the children tested at 3 ; 0.)¹ So in still another detail of language development Y maintains her place well ahead of the average.

Further reference will be made to the apprehension of spatial relations in the next chapter (p. 481).

Learning new words in specific contexts. Whatever may have been the case with the prepositions, we can trace a tendency for some new words to appear only in certain contexts, while the old habit remains of using some specific phrases in their more elementary form when we might expect them to be modified by the use of newly learned words or word-forms. Thus while at 2 ; 2 B said 'Daddy been shave,' 'Maba can do,' 'B go do it,' that earliest two-word sentence 'Daddy gone' remains. He never says 'Daddy has gone.' The same may even apply to the form of a word. B learned before 2 ; 0 to imitate a monkey walk—and called it 'moo-moo walk'. By 2 ; 2½ he learned to say 'monkey' properly, when seeing a picture of one : but he would still say 'Monkey do moo-moo walk.'

This tendency for advances to appear only in specific contexts remains at a later period. Thus there came a stage at which the child would use its own name in certain contexts and the pronoun I in others. For example :

B, 2 ; 6. Still uses his name B for most statements, but always says 'I will' : this I think is the only use of 'I' so far.

¹ *Mental Growth, &c.*, p. 94.

Only 'I want' was noted as an additional use of 'I' by 2;7, though B would then often call himself 'Little Boy Blue'. He would sometimes start a sentence 'B go . . .' then pause and say, 'Little Boy Blue go . . .' Mrs. Thorburn noted the coincident use by her child of 'I' and of the child's own name as late as 3;2.¹ The learning of new words first in specific contexts soon passes into freer use: so that, for example, even in an unlearned sentence the child may use both a name and a pronoun as well: thus Y, 2;0½, 'Wash Y, *me*,' Y, 2;1, 'Daddy give Y pear *me*.' B 2;4, 'B's chair, *my* chair.' Y, 3;6, 'Y will do that, shall I?'

These varying uses at the early stage of learning have a bearing on Stern's assertion that all inflexions come at the same time, and that it is therefore a unitary mental advance.² I should prefer to say that the new elementary thought function may appear as a unit, and so make *possible* a wider range of new usages; but that the appropriate language forms are only gradually learned: and in particular the 'perseveration' of old forms is sometimes too strong for the new function, especially in phrases often used in earlier months. I noted of Y at 3;0 that she had used plurals for some time, but that comparative and superlative endings were not yet used.

We may, however, consider such a development as the use of inflexions as partly due to the slow and steady maturing of the general factor or factors of intelligence and partly to the more sudden development of the group-factor of language during this short space of six months. This would fit in with the fact that we find in a given period—about 2;0-2;6 in the cases of B, X and Y—a whole group of new phenomena in speech, e.g. the use of the negative, new question forms, complex sentences, frequent inflexions, the use of pronouns, and so on. The increase in general intelligence due to mere maturation would result in greater power of grasping relations and so in thinking—as we shall see in the next chapter—and this in its turn would both demand a development of language, and at the same time make it more possible.

Further advances in the period 2;0 to 2;6. In addition to the new usages given above, the following appeared in this period.

B, 2;2½. Understands 'which' and 'who'—answering correctly the question 'Which (or whom) did you see?'

Some of the transition stages in the case of pronouns are interesting: thus.

B, 2;5, when M said 'You have it,' B repeated 'You have it' as he took it; apparently by 'you' meaning himself.

Y, 2;5. 'He wants *her* breakfast.' She knows 'her' but not 'his'.

¹ *Child at Play*, p. 98.

² *Die Kindersprache*, p. 248.

Other advances now are :

B, 2 ; 3. When I contradict a statement of his he sometimes says 'Tis', and sometimes 'Yes'. Also says 'No 'tis' (= it is not). Understanding of 'why?' shown often by sensible answers.

2 ; 4. Says 'B did (S)elf.'

B, 2 ; 5. Another advance shown in the use of several adjectives together, 'Daddy drew great big b(l)ack big puffer.' 2 ; 5. 'Late' and 'too late' used correctly.

As to Y : we have seen that she has been a little in advance of B in practically all language progress : and that remains in this period. Thus she used 'self' at 2 ; 1 (against B's 2 ; 4), saying 'No Y sit self' (not wanting to be lifted).

At 2 ; 3½, the correct use of 'cos' (because) by Y begins against 2 ; 6 with B. As, however, the development of language comes to depend more on the capacity for complex thought, B's record approaches nearer to Y and sometimes, as we shall see, goes ahead of hers.

The learning of words first vaguely as connected with a group of ideas or impressions. We saw that 'hot' was learned first by X as meaning either (a) general unpleasantness or (b) both very hot and very cold, soon transferred by X to general unpleasantness. This is very typical of the learning of many new words relating to concepts which are only just being grasped—e.g. time, space, number : but these will be better considered in the chapter on thought processes.

The period 2 ; 6 to 3 ; 0. With B, X and Y this period saw a considerable extension of verb forms (tenses and auxiliaries), pronouns and conjunctions, and of course an increase of vocabulary generally in all forms already used. Some outstanding examples are given below.

B, 2 ; 6. B went 'ni-ni' (with) Mummy last morning (yesterday morning)—a true statement. Often says 'Yes, I will,' 'No, I will not' or 'No, I not will,' 'Yes, I must.' Says 'our', but uses 'your' for his own things.

B, 2 ; 6½. The use of 'because' appears. F. 'You won't suck your thumb'? B. 'No'. F. 'Why'? B. 'Cos naughty boy'. D. 'Do you like it'? B. 'Very much'—the first adverb of degree.

2 ; 7. Uses 'perhaps' correctly. Asks 'Why?' intelligently—four months after it was apparently understood.

2 ; 9. B having recently called his father the 'elephant' he now transfers it to the biggest dog or bear of a group or even the biggest pigeon.

2 ; 11. A very complex sentence—subordinate within subordinate. M gave him a sweet, and when he asked for another said 'No, you shall have one another day.' B. 'I call you "Daddy" (if) you say I have one nother day.'

It will be seen that by 3;0 B had used all the main elementary forms of the English language, except perhaps the subjunctive mood, abstract nouns and comparative or superlative forms of adjectives and adverbs. In all the records made about X she showed herself somewhat ahead of B; as to Y the following notes show the same:

Y from 2;6 to 3;0. As usual a little before B, Y achieved a conditional sentence at 2;9, with the 'if' expressed: 'If mummy died I'd be alone with my daddy'—not, I am sure, an expression of a wish, but I fear a contemplation of tragedy.

'But' appeared at 2;8 $\frac{3}{4}$. M, 'Don't suck your finger.' Y, 'But I'm in bed and asleep.' 'Perhaps' was used appropriately at 2;11. Also 'I'm not big enough.' At 3;0 appeared 'why' correctly used. This was five months later than B: but Y had used a substitute 'what for' since 2;7, e.g. 'What for S's clothes there?' In any case 'why' is decidedly significant of an advance in thinking.

Complex sentences included: 2;11. 'What shall I do when I go to Cromer?' But one attempt was a little too much for her, viz. 'You have warm(er) hands than me, haven't I?'

Speech after 3;0. After 3;0 new forms in speech are of interest almost entirely as signs of development of thinking: but a few notes may be added. By 3;0 Y was awakening to the idea of correctness of speech: thus she said at 2;11, 'I've got big mouth like S. Mummy got big mouth, Daddy got big mouth, everybody got a big mouth . . . mouthes . . . mouths'—correcting herself with some emphasis. Other notes reveal the fact that B, Y and X, and to a less extent perhaps C, were keenly interested in learning to speak. A showed less interest in the process: and a most marked characteristic of one child reported to me by an old student as very delayed in speech even at 5;0 was that he showed so little interest in conventional speech so long as his own poor imitations were understood. B, X and Y, however, would constantly try to make their speech resemble ours. Thus my wife wrote of B:

B, 3;4. Two or three days ago I tried to teach him to say 'I'm a soldier with a gun on my shoulder.' He tried over and over again but could not manage it: he could not even say 'shoulder' alone. To-day B suddenly said spontaneously, 'I've a gun on my shoulder,' and then said the whole sentence easily after me.

With the girls X and Y there was more of a flow of words—perhaps a tendency to *verbalism*. Sometimes it seemed that Y must apply some expression to an idea, however vaguely connected in meaning. Thus when at 2;11 she had been on a patch of wild long grass and tall nettles she called it a 'lawn'. Or she

might invent a name with existent words: for example, she had been at 3;4½ to Lewis's big stores and gone up in a lift to see Father Christmas. Later she said she had seen Father Christmas in the 'lift-town'. The early vagueness of meaning of words of *time* came out in this: 3;1½, 'I saw a man a long time ago, yesterday.'

Playing with new words. Perhaps there was an element of verbalism also in the way that Y would practise or play with new words, using them almost at random as it seemed. Thus:

Y, 2;8½. Having heard the phrase 'that's —'s manners' she practised repeatedly, 'that's daddy's manners', 'that's S's manners', 'that's chair's manners', 'that's table manners', and so on, suggesting that either 'manners' was being played with deliberately and used absurdly on purpose, or was not properly understood, or both. 3;0. Recently learned the word 'somehow', and now she is constantly repeating it with some added words of no significance, e.g. 'somehow he had a gun'.

Mr. Waterhouse reported as to his boy (who was evidently very precocious as regards speech).

As early as 1;10 J. C. G. discovered the conjunction 'and': he immediately became intensely preoccupied with its function and for days afterwards would make long strings of proper nouns, 'Mummy *and* Daddy *and* Teddy *and* William', &c. Also before 2;0 he was frequently heard, when settling down to sleep, to be systematically 'revising' his vocabulary; repeating to himself in succession all the nouns he had learned so far.

At times Y's play with words would be nonsensical, as when (4;1½) she repeated 'Pink is Bink, Bink is Pink', and so on, over and over again; or when she said, 'I'm reading French' and looked at a book and uttered a long series of nonsense syllables. In the following note I do not know whether to interpret the novel word 'stone' as a joke or a serious attempt to continue the metaphor.

3;11. Said to S as she sat on the beach (urging S to do something), 'Go on, be a sport, be a brick,' and then looking at the pebbles, 'Be a stone.'

The monologue and Piaget's views on it. Soliloquizing may be regarded as a form of playing with speech and this occurred, of course, before the age of 3;0. At 2;3 I noted of Y that she was constantly saying what she was doing as she played about; this was done sometimes when alone, and sometimes when we were present. Thus

Y, 4; 0. I opened Y's bedroom door quietly without her hearing me, when she was playing in her cot and talking to herself. Only after two or three minutes did she turn round and find me there. This soliloquy was simply describing what she was doing.

On the other hand, there was constant play without any monologue, and this needs emphasizing in view of Piaget's statements of the prominence of the monologue even among children of 6 or 7 years.¹ When she was 4; 1 I observed Y at play carefully for ten minutes, three times in one day, and again two days later for a quarter of an hour. She made not a single remark in these periods. When the silence was broken it was when she turned to me with a smile and said, 'Fancy daddy working in the nursery.' Then she brought me a toy signal and said, 'There is lots of lights like this.' At 4; 3 I listened for twenty-five minutes to her play with a little friend one year younger, and there was nothing which could be called monologue or dual-monologue in Piaget's sense till the end of that time; only silence or clear instructions to the friend about the way to play marbles, &c. Perhaps Piaget might have classified some of the remarks as dual or collective monologue. He is not, however, very clear in expounding what precisely this is. The child, he says, 'is not speaking to any one. He talks aloud to himself in front of others.' Yet 'everyone is supposed to be listening'.² The differentia from true monologue seems to be that others are required as an audience, but not as an audience to whom the talk is to communicate anything. Yet this seems inconsistent with the given criterion of 'adapted information'. 'The criterion of adapted information, as opposed to the pseudo-information contained in the collective monologue, is that it is successful. The child actually makes his hearer listen and contrives to influence him, i.e. to tell him something' (p. 10). This surely implies that the collective monologue is 'unsuccessful' in that it fails to influence the ideas of the audience; yet Piaget's own definition suggests that it never seeks to do this. In what sense, then, is it unsuccessful? In any case, how can the success of a speech determine its psychological nature? Surely this depends only on the mental attitude of the speaker.

Collective monologue may, however, be taken to represent a kind of showing off—talking to be heard, as a child may do at an earlier stage, when chattering sounds without meaning: and the amount of this is no doubt greatly affected by the presence of sympathetic parents and brothers and sisters instead of a group of other children about the same age. Piaget's assertion that children do not begin to communicate their thoughts till about

¹ See *The Language and Thought of the Child*.

² Op. cit., p. 19.

7 or 8 is most certainly not true of children within the same family. As we have seen, language is used for communication of ideas before even 3;0.

Some further notes after 3;0 and 4;0. The *flexibility* of Y's language is shown at 3;6 by such sentences as 'Y will do that, shall I?' and, when eating rhubarb, 'Nobody didn't give me no sugar. I feel sour.' At 3;7: 'You'd never do that, never'd you?'

'Ask' was sometimes used when she clearly meant 'tell'. C would do the same: for example, 'Go, and *tell* mother if we can go out'.

Y, 4;1. 'Why' sometimes used for 'because': thus F, 'Your hands and feet are cold.' Y, 'That's why I had a cold bath.' To make sure I repeated 'I said "your hands and feet are cold".' Y (with emphasis), 'That's *why* I had a cold bath.'

Y, 4;6 used 'I am grieved' in very pleasant circumstances. When asked what that meant she replied 'It means that I am happy.' She seems to 'have a shot' with a familiar word, belonging to the same 'universe of discourse'.

Y, 5;0. On a fine day on which warm weather suddenly appeared Y said 'It's like *winter*'; on the eve of going to the sea-side: 'I won't get excited; I wish I could but you want me to be *clever*' (? calm).

A late note on B (4;2) states that he was 'constantly inventing words now'. To my 'Hullo master B' he replied 'Hullo Mr. Wad-no.' Not all the new words are names: some are adjectives and some perhaps verbs.

A good example of the way in which a word may for a long time be used apparently correctly in suitable contexts, and yet mean something different from the conventional, is this:

B, 4;4. When S said that something that I did was 'naughty' I asked B what he (B) meant when he said I was naughty. B replied 'When you do something I don't like, that's naughty.'

Abstract nouns began to appear before 5;0. Thus

B, 4;0. 'I'm so full of tiredness.' 'Wait till I get some more laughing out of me.' C, 4;10. 'Mummy gave me permission.'

Attention to the form or structure of words was present very early in Y, as we saw by her changing 'mouths' to 'mouthes' and then back again, at 3;0. Also at 5;9 Y said that she saw a boy climbing an 'unsafeable' trees. M, 'You can't say "unsafeable", you mean "dangerous".' Y, 'Well, you say "unbreakable".'

Active interest in language as such also appeared in B before he was 6;0, by which age he was reading books for pleasure:

and we were sometimes astonished at the co-existence of elementary errors and ignorances with occasional flashes of understanding. Thus

B, 5;7. Very interested in language. The other night I (M) said, at bath time, that I would only give him a 'lick and a promise'. He wanted to know what this meant and I explained it and said 'It's a metaphor.' B, 'What's that?' M, 'When you say a thing is like a thing but not the same.' B, 'Like killing two birds with one stone?' He then wanted me to tell him other metaphors.

At the same age, having learned the word 'diagonally' through the bishop's move in chess (which I was teaching him) he spontaneously transferred it to his movement across our allotment, suddenly saying, 'I came diagonally that time, Daddy.' It must not be thought that there was an attempt on my part to force a precocious development. Often B and X and Y at least were discouraged in their troublesome inquiries about words which we felt they could not understand: but they would sometimes persist. 'Just see if I *can* understand.' Sometimes one realized that a word which at first might sound hard for a child to understand was really not so; for example, 'amphibious', in reference to the frog, was readily understood by B. At the other times the danger of misconception was shown, as in the following example.

B (6;0) heard me use the words 'elliptical sentence' and asked what it meant. I replied that he could not understand, but he pressed for an explanation. So I said it was 'When you say something and miss part of it out, a part that people can guess: for example, if I say to you 'If you are not good . . . ' or 'If only it would stop raining . . . ' B was silent for a few moments and then said: 'I see. If I say: "This is Sunday" that's a "liptical sentence".' 'Oh, no: that not an elliptical sentence: there's nothing missed out.' B. 'Yes there is: "*not*" is missed out. 'This is *not* Sunday, it's Monday!'

The vocabulary of a boy somewhat precocious in speech. I append here a record of a boy of some precocity in speech. The detailed records which his mother (Mrs. H. Barber) kindly sent to me reveal that she was well aware of the danger of assuming that a word as used by a child is the same part of speech that it is in adult speech. She only took it as clear that a word was understood when it was used in more than one context, and not in a sentence which the child had heard spoken before. She made almost daily records in the early stages: and from 1;0 to 2;0 the monthly totals were noted and analysed. Later, notes were taken of every word spoken for a period of ten days—at 2;0, 2;6 and 3;0. These gave the results set out in the table on the following page.

The boy was the elder of two children, which accounts no

doubt for the relatively late appearance of pronouns. He was like Y in one respect; he would imitate or play with words which he could hardly understand: thus at 2;0 'he would suddenly remark, "Absolutely Daddy"—perhaps in the middle of a meal and apropos of nothing'.

Types of words used by the boy C. B.

Table showing total number of words analysed into parts of speech

Age in months	Total number of words	Nouns	Pro-nouns	Verbs	Adjectives	Adverbs	Prepositions	Con-junc-tions
12	5	4		I (gone)				
14	20	15		I (gone)	I (nice)	I (away)		
16	54	39		6	2		4	
18	109	80		12	9		4	
20	197							
21	290	193	I (it)	51	28	7	7	
22	366							
23	447							
24	566	349	8	111	58	7	11	I
30	728	410	13	140	85	25	12	8
36	1020	571	17	201	129	53	23	11

CHAPTER XXI

Ideational or Thought Processes

Meaning and imagery. We may regard the first step towards the development of thinking as made when an object has acquired some meaning for the child additional to what is immediately perceived.

A suit of armour, writes G. F. Stout, 'looks hard, smooth and cold': but the idea of hardness is 'not separately discernible as an explicit idea'. This is what Stout calls 'complication',¹ and it is perception rather than thinking. A further stage is reached when some perception, e.g. the sound of the mother's voice, calls up an image of something not present, in this case a visual image of the mother. If this image only occurs when the mother's voice is heard, the image is 'tied' to the perception of the voice: it does not exist independently. It is in this form, says Stout, 'that ideas first become implicit—as extensions of present perception'.² In a similar manner, we may imagine, various activities or qualities of the mother become associated with her appearance, and at first are 'tied', in the sense that they are not thought of separately: they may exist for the child as anticipations of, say, warmth and softness on contact, these anticipations being bound up with the sight of the mother or the sound of her voice. It seems quite likely that images do appear in this way as Stout indicates; though I think it impossible to prove that, when once they occur like this, they do not also occur independently. Still, when the first images or, to be cautious, shall we say the first thoughts of objects not present to the senses do first seem to occur, they occur immediately after the object is seen or heard; for example, when B at 0; 4½ while nursing, kept looking round for me after I had once spoken. At 0; 6 B frequently looked for his toys when he had dropped them. At first this was only for a moment or two. Then at 0; 7 the searching was repeated at intervals (of about half a minute) while playing with another toy, i.e. there was a recurrence of the idea of the dropped toy. (Details have been given in the chapter on Learning and Remembering, p. 355.)

Finally, the interval between seeing a thing and then looking for it becomes so long that clearly the image (or other element of ideational activity) is not 'tied': thus

¹ *Manual of Psychology* (5th ed., revised in collaboration with the author by C. A. Mace), pp. 205 and 207.

² *Op. cit.*, p. 209.

B, 0; 11. When put on my knee, B began to search for my yellow pencil in my waistcoat pocket, where he had found it lately. *N.B.*—He had not seen it for 24 hours. (The same thing happened the next day.)

(Charlotte Bühler places at 0; 10-1; 0 a test of remembering the contents of a box, one minute after the box had been removed. The child looks in the box for the missing toy.)¹ This period (about 0; 7-0; 9 in B), at which a missing thing is looked for, coincides with that in which words first begin to mean something to the child (e.g. when B had begun (at 0; 8) to use 'Dadda' as an expression of delight), but words are not yet used to indicate absent things.

A similar extension to a more remote meaning is indicated by the difference between the following two notes.

B, 0; 7½. Was very peevish because unable to go out on a wet day. Later it cleared and when nurse came in with hat and coat on, his face lit up with delight.

B, 0; 11½. Hungry and peevish in playground pen. When M got up and went out to fetch his milk he laughed and bobbed up and down gleefully.

This latter note especially suggests the possibility of a thought of coming events. No mere mechanical association of place with the sight of the beloved mother would explain this, for he rejoiced when she went out of the room.

We have already mentioned the possibility of *eidetic* imagery appearing at this early stage (Chapter XIX, p. 355), and we may surmise from the special vividness of children's images later, that early thoughts of absent objects are probably accompanied by images. Yet the very ready generalization of words ('bow-wow' for 'rabbits', 'Dickie' for 'sparrows'—then for all birds and later for flies) suggests that an image is not always present when names are used. Here, however, there was a name to form the nucleus of the idea. Without a name can the 'free' idea of, say, the mother, function unless there is a visual image? Stout contends that it cannot. 'An idea can no more exist without an image, than perception without sensation': but he points out that a verbal image may serve.² All the experimental work which has gone to show the existence of imageless thought has, of course, been done with adults who can use language as the medium of thought.

Comparisons. While language is our main clue to thought, we can sometimes make tentative inferences from behaviour. Consider

¹ See Bühler and Hetzer, *Testing Children's Development*, p. 125.

² *Manual of Psychology* (5th ed.), pp. 148-9.

the act of comparison, which may be involved in the beginnings of conception. There are signs of comparison as early as 0; 6 $\frac{3}{4}$.

B, 0; 6 $\frac{3}{4}$. Looked quickly from M's smiling image in mirror, back to her face: and then repeated the action as though comparing. 0; 7 $\frac{1}{2}$. Greatly interested in his hand and arm under water in his bath. Gazed at them and lifted them out, over and over again.

Also at 0; 7 $\frac{1}{2}$ B saw my face covered with shaving soap, and gazed at me with a puzzled expression. Here I think the strange *difference in the very familiar* struck him.

Stout says, 'Comparison in all but the most rudimentary form involves free ideas.'¹ I suggest that in the examples above we have a 'rudimentary form' of comparison before free ideas: the essential element being a turning from one to another object simply to get the elementary shock of difference, or the elementary impression of familiarity.² After one year, comparison was active: thus

B, 1; 1. Comparison is very active now: noticed him comparing his hands, one of which is bandaged. Just now has been feeling my hair and then his own repeatedly. B, 1; 1. Comparing clothes pegs, taking one in each hand: looking at their tops; in some there was a hole and in others not.

Y, 1; 4 $\frac{1}{2}$. Y saw S's new boots, and said 'Boo-boo' looking at M. M said 'Yes, boots.' Y now lifted up her foot with her own new shoe on it and showed it to me.

The forming of concepts. Language is our main clue here, but it may deceive, as we have seen: e.g. at first I thought that B's repeated use of 'Dadda' in my presence by 0; 8 $\frac{1}{2}$ showed that it was a symbol for me: but its use also in play situations soon showed that it might be primarily an expression of feeling. The germ of a concept, however, does seem present when at 0; 11 'Ta' was used only in requests for toys, never for food or to be taken up. The earliest uses of 'Dadda' and 'Mamma' are examples of the fact that first words, though classed by the grammarians as 'nouns', are sometimes at least, at once much more and much less than the symbols of 'pure' concepts in the child's mind. They may be, as here probably, expressions of a mental attitude

¹ Ibid., p. 534.

² W. Line thought there was some 'awareness of relation' as early as d. 27 in a baby whose vision oscillated from one bright flower to another for half a minute. But in view of the constant oscillations of the head at this early stage, and the reflex movements towards a bright object, there seems no need to suggest even a rudimentary comparison so early: see 'The Growth of Visual Perception in Children', p. 84 (*Brit. Jour. of Psych. Monograph Supplements*, XV, 1930).

or feeling; or they may be bald commands, as when 'Mamma', in the absence of the mother, seems to mean 'I want mother'. In accordance with this interpretation of Mamma, Stern declares that the first single words spoken by the child are really tantamount to word-sentences.¹ Bosanquet, indeed, goes as far as to say that the concept alone has no reality in living language or living thought except when referred to its place in a proposition or judgement.²

It seems at least possible that at this earliest stage of speech we have the vague expression of what the logician would call a judgement. Yet I do not think that we can confidently assert that at times one word, e.g. Dadda, may not often be simply a label which a child associates mechanically with a given presentation. What we can say is that the omission of the verb in the supposed sentence '(Come) Mamma' is no proof that it is not in some sense thought; for in the chapter on Language we have already given several examples in which an omitted word, especially a preposition, must have its usual counterpart in thought present, and further examples will be given shortly.

The repeated naming of one object, say, Mother, suggests, but need not necessarily imply, a rudimentary concept: it may at first be only an example of the same object producing an associated sound.

Consistent responses, however, to an object which is also named do seem to imply an elementary concept in the sense of a 'cluster of general rules round an image'.³ Knowing how to respond to an object—say, the mother—may exist of course on a perceptual level.

There may even be learned responses to words without the intervention of ideas (as by animals), and certainly without the full understanding of the meaning of the word.⁴ There must, however, be the thought of an object in its absence to justify the term 'concept': and for our purposes, as we cannot be certain when this first occurs, we must admit the value of Hobhouse's further criterion that 'the element common to many experiences' should be 'capable of being combined with other elements'. Hence Hobhouse attaches great importance, rightly, I think, to the first

¹ *Psychology of Early Childhood*, p. 148.

² *Essentials of Logic*, p. 87.

³ L. J. Russell, *Logic from the Standpoint of Education*, p. 4.

⁴ Bertrand Russell's behaviourist interpretations of the understanding of words are truer, I think, of this early stage of childhood than they are of later childhood or adulthood. He writes: 'We may say that a person understands a word (a) when suitable circumstances make him use it, (b) the hearing of it causes suitable behaviour in him' (*The Analysis of Mind*, p. 197).

appearance together of two words previously only used separately ;¹ so that the first proof of the development of the concept is itself also a complete judgement.

Nevertheless, though this combining of two words previously used separately is a fairly safe proof, we cannot conclude that genuine concepts are not formed *before* this stage: or for that matter that complete judgements are not expressed earlier in one word. For it has been reasonably argued that when a child comes in with a new toy and says 'Nanny', that may really express 'Nanny gave me this': mere naming—'Daddy', 'dog', &c., may be the judgements, 'That is Daddy', 'There's a dog'; here again we have no proof, but the child's gesture sometimes strongly suggests the truth of this view.

Why, it may be asked, should we insist that the two words should have previously been used separately if the two words together are to be taken as proof of two generalized elements? The answer is that two words may be originally learned together as expressing one idea, as we saw in such examples as 'good girl' (see the chapter on Language, p. 398).

This second criterion of two words used together would place the first proof of a concept at 1; 4 $\frac{3}{4}$ for Y and as late as 1; 8 $\frac{1}{2}$ for B, when he said the words 'Daddy gone'—having previously used 'go(ne)' alone at 1; 5 $\frac{3}{4}$, and 'Daddy' of course earlier still. This big difference between Y and B seems to me extremely improbable. The criterion is, however, a severe test, and we must consider some earlier suggestions of general concepts.

First generalizings of terms. The using of a common noun to describe objects which are obviously different and yet have some resemblance, might be thought to imply some general idea, even when the name is applied wrongly to objects owing to too wide a generalization. Thus, in the case of B at 1; 1, 'Bow-wow', the term learned for 'dog', was transferred to pictures of rabbits: 'dickie', first used for sparrows, was applied to flies and bits of floating fluff.

Yet we cannot be certain that an idea is truly present merely because a name is widely applied. As pointed out under 'Language', the tendency to speak at this period is with some children so strong at all times, and especially when an interesting object presents itself, that a marked similarity of feeling produced by the two different objects or one point of resemblance between them, is enough to call out a recently learned name. B, as noted, when calling a cow 'Ba', would willingly change 'Ba' to 'Moo' when

¹ Hobhouse, *Mind in Evolution*, p. 328. Karl Bühler also regards the two-word sentence as the unmistakable sign of advance towards the expression of a judgement (*Die Geistige Entwicklung des Kindes*, 1929, p. 400).

corrected. There may be, then, only a vague feeling of familiarity (as in recognition without clear memory) as the basis of such a 'generalization' of words. Still, even allowing for this possibility, some of the generalizations of words given above, and in the chapter on Language, are most reasonably interpreted as implying some apprehension of resemblance; and we may take about 1;3 to 1;6 as the age when the most carefully observed among my children used words in this way. Stern's records suggest the same period for this development in his daughter.¹ It must not, of course, be taken to imply the capacity to think of a class of things as such, with some common quality. It implies the basis, however, of such a fully conscious concept; perhaps it may be called a 'potential concept', to use Groos's phrase.² Nor does it rule out the possibility that even when this stage is reached the basis of a generalized term may sometimes or usually be merely the dominant feeling-reaction rather than a perceived quality of the object. Thus as late as 1;8½ X used the word '(h)ot' not only for very hot and very cold things, but for (perhaps we should say 'in the presence of') anything unpleasant, even a dog!

Ideas of actions. Closely associated (in time of appearance) with the use of generalized names of things, are the words which stand for actions: Possible early examples of the foundation of such ideas are: the understanding of *Ta*—as a request word: and the understanding of 'Patacake' by Y at 0;7½. But these are more likely to be examples of the mere association of sound and action. A further stage is reached when there is the actual use of 'Ta' at 0;9½: (a) as a request word for a toy, and (b) as thanks after receiving a toy. These uses again, however, are only proofs of some association of sound with action, not of a general idea of the activity as such; though the fact that 'Ta' goes with both giving and receiving suggests that now at least it is not a mere expression of desire. We cannot then say as yet with certainty that actions are thought of as such. The words indicating actions are only used when mental activity on the perceptual level might account for everything.

Ideas of *things* absent, however, seem undoubtedly to have developed before this; so that my results agree with Stern that thought has first its 'Substance Stage': e.g. at 1;6 Hilde Stern only referred to objects [especially persons] she remembered. Next, says Stern, comes the 'Action stage'—activities are isolated in thought': (Hilde revealed memories of actions at 1;9). Third comes the stage of 'Relation and Attributes'.³

But the substance stage is, if not coincident with, at least closely

¹ *Die Kindersprache*, pp. 22-3. ² *Das Seelenleben des Kindes*, p. 212.

³ *Psychology of Early Childhood*, p. 377.

followed by, a stage in which the thought of action is sufficiently detached for it to go with any appropriate object, e.g. 'Ta' and 'gone' are not restricted to one object. When action words can be actually spoken thus in reference to different objects, we have, I think, evidence of a *generalized expression for an action*, though some object may still be necessary in connexion with which the action is thought. Certainly my records do not suggest the sudden generalization of the word 'gone' after its first appearance in 'Daddy gone' or 'Gone daddy' (B, 1; 8½) of 'Bo(ttle) aw (all) go', 'all gone' (Y, 1; 6½).

The actual naming of actions with such words as 'climbing', 'drinking', even in simple sentences such as 'Climbing is nice' certainly does not appear as early as the indication of relationships, e.g. by prepositions. To the study of relations, a supremely important topic in the psychology of thinking, we now turn: first, however, concluding this section with a note which shows how persistent an idea may be and how decidedly action may be determined by the thought of some absent object, before the end of the second year.

B, 1; 10. Yesterday he was looking through an illustrated toy catalogue. I said, 'Find a ball.' He looked in vain and gave me the book saying, 'Baw-baw.' I could not find one either, so tried to distract him by showing him trains, &c. He looked at them for a moment but soon gave the book back to me saying, 'Baw', and was not satisfied till I found one.

The apprehension of relations. The subject of relations has, of course, been discussed since the time of the Greek philosophers. Its treatment by the more formal 'traditional' logician has not been of much help to the psychologist. Both 'formal logic and the sensationalist psychology', wrote James Ward, 'have been but blind leaders of the blind'.¹ In recent years the subject as treated by logicians has been revived and almost transformed, especially by its treatment in reference to the foundations of mathematics.²

This is obviously not the place to enter into discussions which are primarily logical and epistemological; I propose simply to take a number of the main recognized types of 'relations' and try to detect their earliest occurrences in the minds of the children studied,

¹ *Psychological Principles*, p. 313.

² See especially the discussion by Bertrand Russell in his *Principles of Mathematics*. For a briefer account, see Professor Stebbing's book, *A Modern Introduction to Logic* (especially Chap. 7, § 5, and Chap. 10, § 2). These treatments, however, are concerned with the comparison and linking together of formal relations—usually a matter of relations between relations, and so more complex, and usually appearing only in later stages of childhood than those we are concerned with in this book. We shall, however, give some examples which hint at the first appearance of such relations.

taking for our headings such relations as are listed by Ward in his treatment of 'Forms of Synthesis',¹ or in the discussion of relations by Carveth Read² and in Spearman's *The Nature of Intelligence and the Principles of Cognition*, Chapter 5. I shall however, reserve for special treatment in the next chapter relations and ideas of time and number and the apprehension of shape.

The efficient handling of objects implies the 'practical judgement' (in the sense in which this term is used by L. T. Hobhouse, *Mind in Evolution*, Chap. VIII), or a vague grasp of certain relations on the 'perceptual level'.³ There is a sense in which the proper use of any transitive verb (e.g. 'Mummy kiss baby') involves some apprehension of a relation,⁴ and in this case the relation may be grasped as applying to an imagined and not merely a perceived situation, e.g. in 'Mummy—door' spoken by Y, 1; 5½, when standing by the door and asking her mother to open it for her. We may regard this as a *relation of agency*.⁵

The words spoken, taken in conjunction with Y's evident purpose, show that the relation was grasped; but, as often, it does not follow that it has not been grasped earlier. In some sense a child may realize his own efficiency as a cause by the age of 12 months; and in this, as we shall see later, we have the germ of the apprehension of the principle of causation.

Though Spearman usually discusses the relations and their education at a higher level, when they are capable of being expressed in language, it is clear from a number of passages that he regards the education of relations as capable of taking place at a more primitive stage of mental development. Thus he refers to research on the apprehension of relation through 'tests of motor and mechanical ability'.⁶ Though it seems genetically improbable that the most

¹ Op. cit., p. 315.

² See his article on 'The Function of Relations in Thought', *Brit. Jour. of Psych.*, Vol. IV, 1911. There is also much that is relevant to the subject in G. F. Stout's *Analytic Psychology*, especially in the chapter on Relative Suggestion.

³ In the sense expounded by Stout, *Manual of Psychology*, Book III, Chap. I. E.g. Stout writes (p. 311) of 'the vague apprehension of likeness and difference' in perceptual activity characteristic of animals.

⁴ Some logicians, at least, treat such verbs as expressing relations, e.g. Stebbing, op. cit., p. III.

⁵ Spearman's classification of relations does not allow for this. In conversation on this point Professor Spearman recently said to me that he would include agency under the 'causal relation', but it seems at least a special type of causation.

⁶ *The Nature of Intelligence and the Principles of Cognition*, p. 70. Spearman even asserts that 'the process of cognizing relations of likeness permeates awareness of every kind'. This seems very questionable. Compare the criticism of Bradley's assertion, that 'distinction implies difference' in W. E. Johnson's *Logic*, Part I, p. 22.

primitive type of awareness involves some apprehension of a relation, yet some vague apprehension of relations may occur at the perceptual level; and in the following pages of this chapter I shall refer to the signs of such apprehension. As we are now, however, concerned with thought processes, we shall study especially the first clearer apprehension of relations in thought, and their expression in language.

The apprehension of relations expressed in language. The correct use of prepositions, like 'on' and 'with', and later of some conjunctions such as 'because', is a clearer indication that a more explicit grasping of relations has begun. We may, indeed, possibly infer from the child's early use of the possessive noun (e.g. Daddy's hat), the grasping of a relation even earlier than those implied by prepositions. The use of the possessive noun appeared at 1;9 with B, and even at 1;4 $\frac{3}{4}$ with Y. The genuineness of the specific individuality of this idea is indicated by the pleasure with which several of my children practised this new-found idea. Thus B at 1;9 is reported as repeating for a period such phrases as 'Daddy('s) hat,' 'Mummy('s) hat,' 'Baby('s) doll,' &c., pointing to each article as he mentioned it. Also at 1;9 $\frac{1}{2}$ when I took hold of his toes and asked 'Whose toe-toes?' B replied, 'Baby toe-toes.' At 1;10 $\frac{1}{2}$, when I tried to get him to say, 'Daddy's boy,' and M tried to get him to say 'Mummy's boy,' he said 'Daddy-Maba boy!'

I cannot see that any of Spearman's list of relations fits this relation of 'possession' unless it be that of 'Attribution'.

As to the *spatial relations* indicated by prepositions, there is an intermediate stage, between the purely perceptual apprehension of the relation of being 'on' or 'in', and the stage when it is fully expressed in language. At this intermediate stage the 'fundamentals' are expressed in language, but the relation, though evidently apprehended, is not expressed. Thus we can probably infer the apprehension of a relation in such cases as the following: 'Mummy hat (on) floor' (Y, at 1;10 $\frac{1}{2}$), and 'B go (on) Daddy knee' (B at 2;1). Here the circumstances clearly showed that the *meaning* was such as to be expressed properly by the preposition 'on'. In such cases the relation is grasped and thought without explicit expression.

About 2;1 to 2;2 the preposition 'in' was used; but the same child during the same period of several weeks may use the preposition on some occasions and omit it on others, being helped as we saw by definite learning in special connexions. We thus have by the age 2;0 clear evidence of the apprehension of a relation without corresponding spoken language, for such prepositions as we have given are actively applied to new situations and are not mere repetitions of sentences heard. The spatial relations are undoubtedly among the first to be explicitly expressed, 'in', 'on';

and 'under' being used correctly at 2; 2.¹ The observations of Stern and others quoted in our chapter on Language, provide further ample evidence of such usages about this period.

Thinking without words. The old dispute as to whether thinking can proceed without language, has tended among modern psychologists to be more and more decided in the affirmative, so far as a limited amount of thought is concerned; while the necessity of language for accurate protracted or abstract thought has been emphasized. Numerous records given in this book of earlier periods (e.g. before 12 months) revealed signs of understanding being well ahead of speech² and even earlier signs of thought processes before language is even understood.

Some of the examples given above seem to indicate clearly the possibility of at least *elements* of thought on a higher plane without corresponding words, e.g. 'Mummy (open the) door.' The sentences in which prepositions are omitted (e.g. 'That too big (for) B, not too big (for) Daddy') are further examples of the same phenomenon. Again, the conditional dependence is realized and expressed, with the omission of 'if', in the sentence of B, 2; 11, when his mother said he must not have a sweet now but could have one another day, and he said: 'I call you Daddy (if) you say I have a sweety 'nother day.' There may, however, in such cases be incipient images of the word sounds 'for', 'if'. Certainly the prepositions are understood (when spoken by others) before the period when phrases are spoken by the infant, in which the preposition is implied but not spoken.

Let us try to look at the process from another point of view, namely, the *first eduction of a given relation* in the mind of a child, beyond the pre-language period.

The first step in this process, as I conceive it, would be the understanding of the terms (used by an adult) indicating the two objects, (1), e.g. 'doll' and 'box' in the sentence 'The doll is in the box.' The child will at first understand only 'doll' and 'box'; next, through seeing a doll *in* the box repeatedly, there would finally spring into being some understanding of the relation of the doll to the box. But there may be no comprehension that 'in' represents the relation between them. This is the stage represented by B's remark, at 2; 1, 'B go (on) Daddy knee.'

Next we may suppose there is another intermediate stage at

¹ See chapter on Language, p. 411. It may be of interest to mention here that time-relations began to be expressed at almost exactly the same period; the first clear examples by B being at 2; 0 and 2; 1 and by Y at 2; 0½. See Chap. XXII, p. 467.

² See chapter on Language, p. 377.

which the word 'in' is *understood* but not yet *used*. This stage is indicated by some of the results in the experiments with prepositions described in the chapter on Language (p. 411). Thus the card was put *under* the box, on the instruction being given, though the preposition was not yet used by the child.

Next comes the stage when the preposition (or conjunction) is sometimes used in *certain learned situations*, but when the relation can still be 'thought' in the absence of the word.¹ Finally the stage is reached when the word is used in all contexts.

Further relations apprehended by the age of 2 ; 0. By the age of about 2 ; 0 in the case of B, X, and Y we have suggestions of the apprehension of most of the types of relations in Ward's or Spearman's list, and by the age of about 2 ; 6 most of these relations are definitely expressed in language.

*Attribution or characterization.*² This may possibly be implied in the phrase: 'Daddy . . . go(ne),' with a pause between the words (B, 1 ; 6½), but it becomes more likely at 1 ; 9½ when B would sometimes say, 'Daddy gone' and sometimes, 'Gone daddy.' Attribution may also be implied in two words by Y at 1 ; 4¾: 'Mama tata' (= Mother's coat); by B's 'Daddy hat' (1 ; 9); and still more clearly in 'Good cakey' (B, 1 ; 10½).

The use of an adjective *alone*, however, does not necessarily imply that a *relation* is educed. For example, it was mentioned before that X (1 ; 8½) said 'Ot' to unpleasant and even very cold things. It may have been, indeed, an exclamatory word expressive of a feeling of displeasure. Again, an adjective may be used as the name of a thing it apparently qualifies; thus B at 1 ; 9 regularly used 'good' instead of 'toffee'; and that 'pretty' was possibly used as a noun even at 1 ; 11 is suggested by the fact that B, after calling some Christmas decorations 'pickby', would turn to other decorations and say 'more pickby'.

A more satisfactory indication of the attribute relation being grasped is the definite conjunction of adjective and noun in a way which could not have been learned as a joint name. Thus B at 1 ; 10½ invented the adjective 'ha-ha' apparently meaning something like 'funny'. He pointed to his chair, at which we had laughed the day before (because of the unusual arrangement of

¹ See chapter on Language, p. 411.

² Some question whether 'Attribution' is a genuine relation; but one of the most acute of modern logicians, W. E. Johnson, discusses the relation of adjective to substantive, and refers to it as the relation of characterization. It should be added, however, that Johnson takes the view that relations themselves are 'specific kinds of adjectives'—'transitive adjectives', he calls them (*Logic*, Vol. I, p. xxxv). F. H. Bradley included in his list of relations The Synthesis of Subject and Attribute. See his *Logic*, Vol. I, p. 264.

the tray), and he called it 'ha-ha chair'.¹ In view of this, and the other examples given above, we may regard it as possible, though not certain, that the apprehension of the attribute relation took place at least by 1; 10½ in B.

Likeness and identity. Spearman treats these two relations separately, but in a footnote remarks without further discussion that identity has been counted to be an extreme degree of likeness. Genetically, at least, it is convenient to treat them in close conjunction.

The apprehension of the relation of likeness is not, I think, necessarily involved in the earliest recognition.² As I have argued in the chapter on Learning and Remembering, primary recognition may simply depend on a vague feeling of similarity—an absence of any 'shock' due to difference—a nascent but incomplete revival of the original setting of the repeated impression, with inability to place the present impression. So we cannot be sure of the apprehension of likeness or identity in the explicit form on the ideational level, even when the child repeatedly calls his father 'Dadda'; though here again we have the preparatory stage waiting for the final flash to take place by which there dawns on the child's mind the fact that the apparition is the same again. Perhaps we can infer we are getting near a more explicit apprehension of a relation of *likeness* when the child extends the name 'dickie' for a bird to flies and kites, as B did at 1; 7. We may recall that comparison of seen objects was evidently very active at 1; 0 in B and at 1; 4 in Y. And this certainly would afford the conditions most favourable for the apprehension of the relation of likeness; and the probability of such apprehension following so soon after is revealed by the fact that the period when a genuine conception of classes of objects seemed to be formed and named was from 1; 3 to 1; 6.³ Explicit wording which reveals awareness of likeness only comes, as in cases of other relations, a considerable time after this probable first apprehension. Thus Y, 2; 3, 'Y's car do *like* Daddy car.' At about the same age (2; 4) B was noted as 'Often saying "*Like* B does."'

The relation of difference. One would expect that the apprehension of the relation of difference is intimately bound up with the apprehension of the relation of likeness. Recognition of similarity at a merely perceptual level would seem to imply the capacity

¹ Stern's records show the use of the adjective at about the same age as those of B and Y. See *Die Kindersprache*, p. 36.

² Stout, however, maintains that mere recognition or identification by a dog of its bone implies some vague awareness of the general or universal (*Manual*, p. 310).

³ See this chapter (section on First Generalizings of Terms, p. 425).

to recognize differences. The earliest recognition of the mother's face, for example, implies the perceptual discrimination from the faces of strangers. We might then expect that the actual apprehension of the two relations on a conceptual level should also appear at about the same time, and I am inclined to think that it does. I am, however, unable to find notes of an expression of the apprehension of difference as early as those relating to likeness. But this is not surprising, for it would seem that a child must very early begin to realize that most things in the world are different from one another and require different responses. The idea of difference would only seem to spring up, and prompt expression in language, where the child antecedently expected similarity. I found a note at 0;7 to the effect that B looked at me in a very puzzled concentrated way when he saw my face covered with soap lather for shaving, but he would not gaze at me at this stage merely because my face looked different from, say, a frying-pan, and similarly at the conceptual level.¹

That there may be a remarkable discrimination of differences at an early age is clear from various records. Thus: at 1;10 B had a set of 26 bricks with small pictures of animals on them about 2 inches square. He was able at this stage to pick out many of the animals named, and at 1;11½ I noted that he could even distinguish and pick out by name the ibex, the elk and the reindeer from one another, though they looked very much alike. Observations in Chapter XXII (in the Section on Form) also reveal a notable capacity for such discrimination, and it seems unlikely that these developments of discrimination would not be accompanied, or soon be followed, by the actual apprehension of relations of differences. The child, however, would not usually feel any impulse to express such differences, though at 2;1 B did on one occasion, in judging a circle, say, 'O, not (s)quare.' Somewhat later, namely, 2;10-3;1, Y often emphasized contrasts by repeating such phrases as 'I'm a little girl, M's a big girl, P's a little boy, Q's a big boy,' &c. Sully's boy showed a love of contrasting as early as 2;3. For example, 'If his father says, "That's a little watch," he at once adds "That not a big watch"'.²

When likeness or unlikeness can be detected and thought of we have the basis for a crude kind of reasoning by analogy and for

¹ Cf. James Ward, *Principles of Psychology*, p. 305. 'The growing mind passes beyond mere perception when some striking peculiarity in what is at the moment noticed, is a bar to its definite recognition.' Elsewhere (p. 330) Ward writes 'Absolute diversity . . . disparateness . . . affords no ground for relations.' Hume, as Ward points out, considered 'difference' rather as a negation of relation, than anything real or positive.

² *Studies of Childhood*, p. 442.

simple generalizations. As usual in studying the beginnings of thinking, we cannot be sure that there is more than mechanical association through, and a response to, the element of similarity between two objects, until we come to a child's expression in language which clearly goes beyond this. It seems evident that there is conscious comparison and that likeness is really thought of when B at 2; 4 is constantly saying, 'Like B does' and Y at 2; 3 says, 'Y's car do like Daddy's car'; and unlikeness can evidently be clearly grasped when it can be thought about as it was by B also at 2; 4 when he said '(Th)at too big (for) B, no too big (for) Daddy.' There is a surprisingly subtle detection of similarity revealed in the example already given (under 'thinking without words') when B at 2; 11 said to his mother, 'I call you Daddy (if) you say I have a sweety 'nother day.'

This apprehension of likeness and unlikeness is, of course, also the basis for wider generalizations, and though the first reasonings are, as Stern emphasizes, from particular to particular¹ we find wider generalization following them very quickly—before 3; 0 in Y and B. The transition from observation of likeness to generalization is beautifully illustrated by the following remarks of Y at 2; 11: F: 'Hasn't S got a big mouth?' Y: 'I've got big mouth like S. Let me see you got a big mouth. Mummy got a big mouth. Nannie got big mouth. Everybody got big mouths, mouthes.'

Such generalizing of names as we have given in the chapter on Language (e.g. 'dickie' meaning sparrow, hence butterfly, hence fly, hence floating piece of fluff) implies at least some vague perception of similarity, and the later transferences of this kind reveal perceptions of resemblances which may be the basis for analogical reasoning: some examples of these will appear later but I should like to quote here two good examples of analogical inference at this early stage of 2; 0 given by Mrs. Moore.

1; 11½. The corner of his napkin bent up against his face, and this he attributed to the wind which blew under his cape and raised it in a similar manner. 2; 0. He asked his mother to mend a broken leaf. She said she could not. He sat as if thinking for a few moments and then looked and said 'Mamma mend(ed) sofa; mamma mend(ed) rabbit.'²

Further relations expressed during the period 2; 0 to 2; 6. (For average child about 3; 0 to 3; 6.) This period is rich in the expression of relations and the development of thinking. We shall have to give detailed consideration to the causal relation, and to early

¹ *Psychology of Early Childhood*, p. 399.

² *Mental Development of a Child*, p. 103.

generalizations. Here I mention briefly a few other relations of interest.

The preposition 'with', used by Y at 2; 3½ in 'I brush my hair with Daddy brush,' seems to reveal another relation, perhaps a special form of 'agency' or 'medium' or '*instrument*' relation, not included in Spearman's list.¹

So astonishingly fast did the children progress in capacity for thinking at this period that, soon after the time when they first grasped the relations between two ideas represented by simple words, they began to understand and express a relation between two complex ideas, each represented by a sentence. Thus: Y, 2; 3½: 'Come up, Daddy (out of cellar), 'cos it's dark.' X, 2; 5: 'I'll ask Daddy to draw 'nother pussy, 'cos I flew those pussy cats away.'

'If' was implied by B at 2; 5½ and correctly used by Y at 2; 9: 'If Mummy died, I'd be alone with my Daddy.' Perhaps the most surprising example of the grasp of a relation at this early stage was the sentence just quoted by B at 2; 4, '(Th)at too big (for) B, no too big (for) Daddy'—the first glimmering of the idea of relativity!

First generalizations or summations. This period around 2 to 2½, so important for progress in the apprehension of various relations, is marked by the discovery of the first elementary generalizations (beyond the type of generalization involved in *applying* a name to all objects of the same class). In the records on some children, the first generalization to appear (implicitly at least) is the apprehension of the fact that everything has a name,² which Stern regards even as the child's 'first real effort in thought'. As we saw in the chapter on Language, Stern thinks this generalization is implied when the child repeatedly asks the name of things, or gives names to everything, which would place the generalization at about 2; 0 in the case of B and Y, and even earlier for the children of Stern and of Mrs. Moore. Sully's boy also at 2; 3 began 'a sudden and energetic' raid on the names of objects and persons.³

Here again we cannot be sure that the child actually formulates a general rule—'All things have names'. If he did, why does he not then or very soon afterwards express the wonderful discovery in a sentence? for very soon after, as we shall see, we do find general propositions beginning with 'All'. It is conceivable that, so many objects having had names attached, there is an attitude

¹ Professor Spearman, in conversation on this point, said he would regard this as a case of the causal relation. Agency is generally causal, no doubt, but it seems to me that the tool- or medium-relation is unique.

² See our chapter on Language, p. 404.

³ *Studies in Childhood*, p. 439.

of expectancy aroused by mere 'thinghood'. The suddenness, however, of the arrival of the question, 'What's that?' (as recorded under Language, p. 405) and its persistency, do suggest some new development. So does the repeated asking 'Why', which began with B about 2;9 and with Mrs. Brash's child H. T. B. at 1;11, 'a phase of endless "Why's"'; and young Sully's pestered at 2;3 with 'why things were as they were, or why they were not different'.¹ These also seem to imply some awareness that everything has a reason or purpose.

For evidence of a general proposition explicitly formulated we have to go to a somewhat later period, but not nearly so late as some have supposed. Thus, my daughter Y at 2;9½, after looking round the room in which were all the family, said 'Everybody's here.' And even at 2;4 I noted her repeated use of 'all' in reference to several people. Again at 2;11, as we have just noted, she said, 'You got a big mouth. Mummy got a big mouth. *Everybody's* got big mouths.' In such instances we have a kind of summation as to objects immediately perceived. Mrs. Barber reports to me of her son:

C. B. at 2;1 said: 'Mamma having breakfast, Daddy having breakfast, C having breakfast, we *all* having breakfast.' He also remarked: 'Big boys ride bicycles.' Many of his generalizations refer to big boys. C. B. at 2;9 explicitly stated that everything had a name. He asked what a strip of coiled iron work on a building was called. His mother replied 'Nothing,' but he replied 'But everything *must* have a name.'

It is possible, of course, that he had been told this and so was helped to understand the general rule: but he evidently now grasped it well enough to use it efficiently. C. B. seems to have been a more precocious child than any of my own, and Stern reports that his daughter H at 3;6 could not understand the generalization 'All birds lay eggs', and this in spite of the fact that undoubtedly a child will be helped to grasp such a generalization through its expression by an adult.² Here we have to bear in mind (i) individual differences (H's first general statement seems to have been at 3;8 when she said, 'I call it roast, mother does: every one calls it so'), and (ii) the fact that these early generalizations are only very intermittent at first, flashing out apparently with things of special interest.

We shall discuss generalizations more fully later, from the age of 3;0 to 5;0 or so: but I give here an interesting note on the use of the term 'animals' by B, because it links up generalization with the development of concepts.

¹ Op. cit., p. 447.

² *Die Kindersprache*, p. 236.

B at 2; 6 said 'See an(i)mals in puffer.' He had put two toy dogs, a cat, a bird, a monkey, a tortoise and a ninepin in his engine. I asked him 'Is Fluffy (a dog) an animal?' B: 'No—Fluffy.' After he took them all out again I said 'Put all the animals in the puffer.' He proceeded to do so: but when I said 'Is that (which he had just put in) an animal?' he said, 'No—pussy.' So apparently he will not apply the term animal to them individually, but he calls them animals when all together.

It may be said that the knowledge of the name of each individual animal would oust the general name when B was asked 'Is that an animal?' But note that he said 'No' in answer to the definite suggestion that the cat was an animal. It would seem rather that there is a stage at which a name may be applied to a group without the child realizing that it applies to each individual, as indeed is often actually so with collective nouns; each M.P. is not a 'Parliament'.

Human motives and the causal relation. Let us now consider the approach to the understanding of the causal relation. The best clues to the grasping of this relation are questions which imply the idea of a cause, or the appropriate use of the conjunction 'because'. This, of course, may express a purpose or motive, a reason or justification, as well as a physical cause. It should be noted also that the use of 'because' may sometimes introduce a universal rule which is given as the major premise from which something is inferred, which would come under the heading of 'relation of evidence'.

Psychologically it may be argued that in expressing a motive or reason one is also expressing a true cause. Yet it is not, of course, necessary for the child to grasp this when it says, for example: 'I love you, mummy, 'cos you a good girl and you got a kind face' (C at 2; 3). One may suspect, however, one origin of the idea of one thing bringing about another in the following note: B at 2; 3; when I pretended to cry at his running off to his mother, and when I asked, 'Why did Daddy cry?' B replied: '(Because B) go (s)ee mummy.'

Let us trace in detail the development of 'why' questions in Y and B, and the use of 'because'.

The understanding and use of 'why'. Long before 'why' was used, Y at 2; 1½ is noted as 'constantly asking "What this for?"'

Y at 2; 3 showed an understanding of 'why' and gave suitable replies, but without expression of 'because'. Thus: when she got out of the warm car Y said 'I go in car.' F: 'Why?' Y: 'I get cold here.' I repeated 'Because you get cold here.' Next day again I inserted 'because' for her, in one of her remarks. Then I gave her a new question: 'Why are you going to bed?' Y: 'Cos I too hungry' (confused with 'tired' apparently). With this slight coaching on one or two

occasions, Y spontaneously used 'because' correctly in a new situation at the age of 2 ; 3½, saying when I was in the cellar, 'Come up, Daddy, 'cos it's dark.'

Without this coaching B showed three months' gap between the understanding of 'Why?' (shown by sensible answering to 'Why' but without saying 'because') and the proper explicit use of 'because'.

From 2 ; 3½ on, frequent replies by Y show an understanding of 'Why' when referring to human motives, and soon when asking for a reason or justification, e.g.

Y (2 ; 3½): 'Get off, Daddy' (when I was on a chair used for her doll's house). F: 'Why?' Y: 'Cos it's baby's chair.' At this age she often uses the phrase 'Cos it's nice.' Y, 2 ; 7. To test if she would use 'why', I said, when we were good friends and there was no conceivable reason for punishment, 'I think I shall smack Y.' Y: 'No, Daddy.' F: 'Yes, I must smack Y.' Y: 'What to do?' (apparently 'What for?').

A week later, Y was reported as asking, at the unusual sight of a boy's flannel suit in a bath, 'What for S's clothes dere?' Thereafter there was further use of 'what for' as apparently meaning 'why', and at 2 ; 8 an older child reports being pestered by Y with constant 'what for' questions.¹ Mrs. Barber also noted that her boy used 'what for' (at 2 ; 5) before he used 'why', e.g. 'What's the boy running for?' but soon after (2 ; 5½) appeared 'Why you do that?' Dearborn writes of his girl L at 2 ; 8, 'She does not yet ask why things are so and so, but often does ask, "What do you do that for?"'²

At 3 ; 0 Y used 'why' for the first time—in the same sentence with 'what for'. 'What you do that for, S. Why?' Yet as much as a year later 'why' is apt to be used for 'because'; thus,

Y at 4 ; 1½ (in response to F's remark, 'Your hands and feet are cold') said, 'That's why I had a cold bath' (she had just had a tepid bath instead of the usual hot one). To make sure I had heard correctly, I said 'What did you say? . . . Your hands and feet are cold.' Y (with emphasis), 'That's *why* I had a cold bath.'

By 4 ; 3 I have no note as to Y using the word 'why' in reference to anything but human actions and motives. The first question by Y as to physical causation was at 3 ; 8: she asked 'What makes

¹ Cf. the French form 'pourquoi' which seems nearer the primitive psychological origin of the 'why' question. Our own 'why', said to be derived from the 'instrumental case' of the word meaning 'who', may correspond rather to the question 'by whom' and so have been more causal originally.

² *Motor-Sensory Development*, p. 191.

the water come again?'—in the puddles on the path when I forked the path to get rid of the water.

As for B, it was noted that he also understood questions in which 'why' appeared at the same age as did Y—namely, 2; 3. Here again it first had reference to human actions, as we have just seen (p. 437) when he answered my question, 'Why did Daddy cry?'

As with other words, the use of 'why' by others gives the child the clue to the meaning, and the first use of 'why' by parents or older children in speaking to a smaller child, would almost invariably be to ask the child's motive or the reason for a request or statement of his intention: it would practically never be used as an inquiry as to physical causes—except of course as a test of understanding. Thus the first occasions on which the understanding of 'why' (by both B and Y) was noted, was when they were asked as to motives or reasons for their own actions or for their father's.

Also at 2; 3 (a week after the above conversation) I promised B I would draw 'puffers' if he would do an experiment we were engaged in at the time. As I was drawing I said: 'Why is Daddy drawing puffers?' B: 'Do (ex)pemme(nt).' As with Y, this understanding of 'why' by B is soon afterwards followed by the use of 'because' which takes place before the use of 'why'. Thus the following conversation took place with

B, 2; 6½, on his going to bed: F: 'Don't suck your thumb.' B: 'No, big boys don't.' F: 'B won't suck his thumb.' B: 'No.' F: 'Why?' B: 'Cos naughty boy' (i.e. because it is being a naughty boy to suck your thumb).

Three weeks later is noted his first use of 'why'.

B, 2; 7 (when told he must not play the piano): 'Why?' F: 'Because you mark it.' B: 'Why?' F: 'You spoil it.' B: 'Why?' and so on. 2; 8. 'Why?' asked now as to motive of another: 'Why mummie do like that?'

(It will be recalled that Y's first actual use of 'why' was also in reference to the motive of another.)

At 2; 10, B asked, after crying, 'Why me cry?' and then himself supplied the (apparently) right answer. (The introspective psychologist at 3 years!) By 2; 11 B is noted as constantly asking 'why' questions and passed (for a week or so only) through a phase when he asked it in apparently absurd contexts, thus: B: 'What's that?' F: 'A horse.' B: 'Why?' This may, however, have been a genuine query as to why the name was given. A week later I noted: 'B constantly asking "why"—it seems like every third remark—but never where it is nonsense'. (Incident-

ally this period of much more frequent 'why's' looks like a sign of a realization that everything has a cause or reason.)

At 2 ; 8 occurred the first question which probably had a reference to a cause other than human. B asked, 'What making that noise?' At 2 ; 11 he asked why we saw our reflections in a railway carriage window. He seemed satisfied with the answer that it was 'like a looking-glass'. It is clear, however, that in the case of both Y and B there is a considerable period of at least four or five months in which the child frequently asked 'why' in reference to human motives, reasons for prohibitions and the purpose served by things, before they asked them in reference to physical events.

Mrs. Barber's boy, C. B., followed his 'what for' (2 ; 5) and 'why' (2 ; 5½) about human motives more rapidly by a question, 'Why is it cold?' at 2 ; 6. Mrs. Brash's girl, H. T. B., as early as 1 ; 10, used 'because' in reference to a human action: she was asked, 'What is J crying for?' and replied, 'Cos she wants to go in the garden.' Then at 1 ; 11 came 'a phase of endless why's': e.g. 'You are a naughty girl, H. T. B.' 'Why am I a naughty girl, Mummy?' At 2 ; 4 on arrival at the seaside, after previous conversation on the causes of rain, H. T. B. looked at the sea and asked, 'Is this what makes the rain?' Apart from this the first question as to physical events is not till 3 ; 3, 'Why do flowers die?' Preyer's child also first used 'Why?' (at 2 ; 10) in connexion with human purpose. 'Why go home? I don't want to go home': followed soon apparently (though Preyer does not give the length of the interval) by the query about the creaking of the carriage, 'What makes that?' an easy transference as almost the first day in which an infant realizes its own power as an agent is as a causer of noise.¹

Similarly the records about Dearborn's daughter and Stern's daughter show at least a slight precedence of the apprehension of psychological causation or purpose. The latter's first use of 'because' in a statement about inanimate objects (at 2 ; 5) is as follows: 'When she was going for a walk, Eve said: "But the trees can't go with us." To the question, "Why not?" she answered first, "Because they don't want"; but on being asked again, "Because the trees is so firm in."' ² Here it will be seen the child first gives a psychological reason, even in reference to inanimate objects, a good example of the early animistic and even anthropomorphic view of nature.

Thus the mode of development of the idea of causation, as it is revealed in these records of child language and thought, is quite in accord with the view that the idea of the causing of one thing

¹ Preyer, *The Development of the Intellect*, p. 183.

² *Psychology of Early Childhood*, p. 393.

by another in the external world, is derived from our own experience as doers and causers of changes. As Ward says :

When in ordinary thinking we say A causes this or that in B, we project or analogically attribute to A what *we* experience in acting and to B what we experience in being acted on ; and the structure of language shows that such projection was made long before it was suspected that what A once did and B once suffered is liable to be done and suffered in the same circumstances again.¹

With most English philosophers we may regard as inadequate Hume's famous theory of the appearance of the idea of causation, namely, that the frequent following of *b* upon *a* gives rise to an expectation of *b* when *a* recurs, and that the fact that a man 'feels these events to be connected in his imagination' is the sole thing which gives rise to the new idea of causation.²

There seems to be, however, a certain element of psychological truth in Hume's theory. The *condition* for the arising of the very first idea of a causal link between two outside occurrences, *a* and *b* (I leave the question of the self as a cause for the moment), is no doubt the repeated conjunction of *a* and *b*. The repeated provision of the two 'fundaments', to use Spearman's terminology, provides exactly the conditions required for the eventual springing into consciousness of the idea of causal relation.

Is this, then, the sudden appearance of something quite new, another miracle of emergence? Not entirely; for the child, long before the period we are considering (about 2 ; 6), has had repeated experience of himself as an agent from the earliest months; and as we saw, Y grasped the 'agency relation' between other persons and things they can do, by 1 ; 6.³ It is then, at this early stage, that we must expect the first dawning of the idea of causation, which at a later stage (about twelve months later) begins to be applied to externals, independent of personal agency.⁴

¹ James Ward, *Psychological Principles*, p. 343.

² See the criticisms of Hume's views by James Ward, *Psychological Principles*, pp. 341-3.

³ See this chapter, p. 428.

⁴ A searching analysis of various types of 'why' questions asked by children chiefly about a year or two older than we have been considering (i.e. from 3 ; 6 to 5 ; 0 or 6 ; 0) is given by Mr. Nathan Isaacs in an Appendix in Dr. Susan Isaacs' *Intellectual Growth in Young Children*. He finds that the main essential function of the 'why' questions is 'epistemic'; that is, they arise from puzzlement in the growth and organization of knowledge. He repeatedly points out that there are other types of 'why' questions, but a passage on p. 302 suggests that other types of 'why' questions are 'all originally related in some way to situations of unexpectedness', though a whole group of 'why' questions become differentiated from this origin. As Mr. Isaacs points out (p. 305), the appearance of 'epistemic questions' in the child is the more remarkable in that 'whys' addressed to him by

The apprehension of causation of physical events. As we have seen, B at 2; 8 asked the question 'What making that noise?' and also why we saw our reflections in a railway carriage window. The former question probably did not refer to human causation and the second certainly did not; notice, too, that the latter question was in reference to something new and surprising, not to a familiar sequence. Y at 3; 8 asked her first question about physical events: 'What makes the water come again?' Here again this first question is about an event she had probably not seen before.

Y at 3; 10 was picking flowers when the sun was shining brightly after a shower; and she said: 'This grass is dry, you know: all the sun.' At 4; 0½: F: 'You see those trees moving.' Y: 'Yes.' F: 'Why do they move?' Y: 'Because it's windy.' F: 'What makes them move?' Y: 'The wind.' F: 'What makes the wind move?' Y: 'I don't know.' When it was thundering I said: 'Do you hear that?' Y (4; 2): 'Yes, that's thunder. That makes it's going to rain.' When some one was crunching toast, Y (4; 2) asked: 'What makes bread make a noise?'

We may then have the dawning idea of causation of physical events at the early age of from 3; 0 to 4; 0, but the rarity of such questions before the end of the fourth year (when my note-taking began to be less regular) exemplifies well what was said in Chapter III about the intermittent nature of development. The idea seems to

parents and nurses would never be truly of this type proper, but 'motivational' or otherwise psychological. The child might, however, hear questions of the 'epistemic' type made by other children to adults, or to one another; but I agree that this would not be enough to account for the facts if there were not, as Mr. Isaacs asserts, within the child 'a powerful intrinsic drive of attention and interest in the right direction'.

My own observations and others quoted above, on the very first beginnings of the use of 'why' (by infants of 2; 6 to 3) suggest clearly that the first uses of 'why' are in asking motives, and that the first understandings of 'why' (in the preceding six months, 2; 0 to 2; 6) were in answer to questions as to motives asked by the parents; also there is evidence of the close association of the first 'why's' with the use of 'what that for?' actually passing into 'what you do that for, why?' I am sceptical as to the presence at this early stage of any epistemic element in the sense of any felt need to co-ordinate ideas; yet even if the epistemic is not the original type of the 'why' question, I believe that some of the 'why' questions soon *after* the very earliest, and at least as early as those Mr. Isaacs examines, are capable of the interpretation he puts upon them. He claims, as he says later (p. 332), that 'children do tend at a quite early age, often between 4 and 5, sometimes earlier, to develop some degree of concern about the truth, sufficiency, or clearness of their knowledge, because they frequently stumble into situations which force just this concern upon them'. If the little child at this age has no concern about truth, he does show curiosity about facts; he is puzzled if they seem to conflict, and wants to fill in the gaps of ignorance.

appear as a momentary gleam, not to recur for days and perhaps weeks.

I made special requests to my collaborators for observations on the first appearance of questions about physical causes. Mrs. Barber's first note of such a question by the precocious C. B. was at 2;3: 'Does the thunder make the rain come down?' The next was at 2;8, 'Why is the sky blue?' The next at 3;0, 'Why does the holding end of a spoon get hot?' an interesting question because it implies a previous acceptance of the idea that the hot milk would make hot that part of the spoon which was immersed. After 3;0 questions by C. B. were 'more and more connected with physical causes'.

Mrs. Brash's first note of such a question (quite spontaneous) is of her girl H. T. B. at 3;3: 'Why do flowers die?' The girl J. M. B. at 4;1 asked 'Why is it always wet inside my mouth?' and also 'How is water made?' At 4;6 J. M. B. asked 'Why is the water-bottle cold in the morning? Does the heat go into me?' 'Yes.' 'Then why am I not as hot as the bottle was?' Sully's boy at 3;9 asked 'How can trees and sheep grow without anybody making them?'¹

Stern's boy at 2;10 asked 'The tray is hot, why?'² Scupin's boy at 2;8 remarked that the sun made his fingers 'blutig'.³ Another boy of 3;7 asked 'What keeps the sky up?' and at 4;1 'Why doesn't the ink run out when you hold up a fountain pen?'⁴ A boy of 4;0 holding wet raffia in the fire asked 'Why won't it burn?' and when he himself was asked 'why?' replied 'Because it's wet.'⁵ Of somewhat older children over 4;0 and 5;0 there are more frequent records of interest in and 'why' questions about physical events and causations.⁶

Though there are such beginnings of ideas of physical causes by the age of 3;0 (mental age probably 4;0 to 4;6) and in some cases even earlier, many ideas of physical events are still mingled with those of human agency, and so we get *anthropomorphic ideas* appearing. To these we shall return later; but first we may consider some conclusions of Piaget's as to the development of the idea of causation. Piaget studied older children—mostly from 4;0 to 10;0 or 11;0.⁷ His records show that even in the period 4;0 to 6;0 or 7;0, the ideas of human activity as a cause precede the

¹ *Studies of Childhood*, p. 457.

² *Psychology of Early Childhood*, p. 392.

³ Quoted by K. Bühler, *Die Geistige Entwicklung des Kindes*, p. 407.

⁴ See 'The Scientific Interests of a Boy of Pre-school Years', by Two Parents, *Forum of Education*, Vol. VI, 1928, pp. 21 and 22.

⁵ See S. Issacs, *Intellectual Growth in Young Children*, p. 149.

⁶ Op. cit., pp. 125 ff.

⁷ See his book, *The Child's Conception of Causality*.

idea of true physical causation: Piaget also agrees that the idea of force owes its existence to inner experience (p. 126). Indeed, he thinks that the idea of true causality does not appear till about the age of 7 to 8. In this, as in other matters, my chief criticism would be that Piaget puts the date of the first appearances of various elementary processes far too late, and he tends to fail to give an opportunity for evidence to appear because of the type of questions he puts to the children. Certainly spontaneous inquiries as to physical causation occur, as we have seen, as early as the age of 4, and even at 3;0 in the case of children well above the average intelligence. (An I.Q. of 150 would mean that the mental age at 3;0 would be 4;6.)

Piaget argues, quite soundly as it seems to me, against any conscious generalization from experience of the self as a moving cause to the force lying within other objects. Some of his wording may indeed suggest to the reader that he regards the idea of force as having nothing to do with conscious experience; but in this connexion apparently Piaget means by 'conscious experience' what would more exactly be described as reflective, introspective experience. Granting, however, this main point of Piaget that there is no deliberate generalization from self-experience to that of others, I think that here again he does not do justice to some of the early attempts of the child to think things out rationally. He makes the interesting generalization (p. 129) that 'in the measure that the child is ignorant of the existence of his own thought, he attributes life and consciousness to every object' . . . 'and in the measure that he discovers his own thought he withdraws consciousness from things around him'. Now I suggest there is a sense in which the child may become conscious of his own thought at a much earlier age than Piaget supposes; and if so, this may affect Piaget's position, as I shall indicate directly.

Nevertheless I should suppose (as I take it Piaget would) that there is a process of *Einfühlung* (a word Piaget does not use), of reading force into things, occurring in the mind of the child, before he gets to the stage of reflection upon himself as such—of knowing his own 'I' as Piaget puts it; though I should think that the experiencing of the self as a causative agent may come before such a process of *Einfühlung*. The ambiguities of the translation of some of Piaget's sentences makes it uncertain whether he would agree with this; e.g. on p. 129 he says 'If force were really in the first instance *experienced in the "I"* and only subsequently projected into things, then we could speak of induction' (and he will not); 'but if it is in the things around him and *before knowing his own "I"* that the child discovers force', then, &c. Here Piaget seems to use the phrases 'experience in the "I"' and 'knowing his own

"I" as synonymous; I take it he means in both cases to refer to the self-conscious, introspective awareness of self and its experience, though for most psychologists the two phrases would mean different things.

Further, even the self-consciousness, the isolation of the self in thought, begins early enough to be the possible basis of that transference from self which Piaget finds unlikely. The reference to the self by name may occur before the end of the second year: at 1;9½ B called himself 'Baby' and Y did the same at least by 2;0. At 2;0 A pointed to himself when we asked 'Where's A?' The use of 'I' comes very shortly afterwards; Y used both 'I' and 'me' at 2;0. The sensible use of 'self' may occur about the same time, e.g. Y at 2;1, 'No! Y sit self', and 'did self' by B at 2;4. By 3 we get frequent contrasting of the self with others, e.g. 'I'm a good girl'—when another girl is scolded. Hence before the lowest age at which Piaget applied tests as to the idea of the origin of force, there may be present that element of self-consciousness which he admits would provide the basis of transference or 'induction' of the idea of force from the self to other objects. Of course it does not follow that because the basis is there, it is necessarily used; but the proof of its presence removes an argument against such 'transference' by those who regard such a basis as essential.

In his book on *Judgement and Reasoning of the Child*, Piaget it seems to me, fails to allow for the fact that *objective reality* may stimulate in the child's mind the thought of the possibility of facts being in conflict with his own desires, at least as early as personal intercourse stimulates the idea of conflict. This same under-estimation of the influence of objective reality may account for Piaget's late placing of the first dawn of consciousness of self as well as of the first checking of purely egocentric thought.

The beginnings, then, of these types of elementary thought-process occur much earlier than Piaget has allowed for; and if this criticism is valid, it indicates the necessity of the study of the earliest years of life as a supplement to, and basis for, the kind of work which Piaget has done. It may be that, as he found, a child of 5 or 6 or 7, when asked 'What do you think with?' cannot do better than reply 'With my mouth' or other words that suggest an identification of thought and speech: but Y at 2;8 suddenly asked me when I was silent, 'What you thinking about, Daddy?' Even at 2;6½ Y asked M 'What you thinking about, Mummie?' M told her and asked 'What are you thinking about?' Y (who was looking out of the window looking out for S coming home), 'I'm thinking S is coming.' Again at 3;11 after Y had been silent for some time, she spontaneously said

'I'm thinking about those little dogs.'—These remarks show that even a child much younger than Piaget's subjects need not really identify thought and speech and must not be supposed to identify them merely because she cannot give a good answer to a difficult psychological (or physiological) question like 'What do you think *with*?' Y, by the way, in answer to that same question, 'What do you think *with*?' replied 'A toy,' no doubt confusing in this context 'with' and 'about'—another example of the way in which formal tests and questions put for a definite purpose may be inadequate as a guide to the thinking capacity of the child at the given stage, without the counterbalancing observations of the child in the midst of its own everyday activities, and of its spontaneous remarks.

Part-whole relation. I have only one note on this, but I think the relation must have been grasped earlier than this.

Y at 3; 8 (when she had only got a few of her Easter eggs), 'I've only got part of my Easter.' Later I put a question to see if the relation was really grasped. F: 'What is part of me?' Y: 'You could have only your eyes.'

The relation of evidence. The relation of evidence is grasped when a person sees that the truth of some statement depends on and is proved by some facts which are the evidence.¹ Here, again, we can often suspect the apprehension of this relation on the 'perceptual level'. We are now, however, concerned with the proof of a clearer consciousness of the relation based on its expression in language. My own earliest possible examples are these:

Y at 3; 0. F: 'Is Snowball a good dog?' Y: 'Yes.' F: 'Why?' Y: 'Cos it hasn't been squeaking.' Y, 3; 1, when 'reading' a book: 'Big girls read, don't they? I'm a big girl.'

It might perhaps be doubted whether there is here an inference that she was a big girl or whether she wanted to read because big girls read; but the next example at least is convincing.

Y at 3; 2 when playing with a younger child: 'I'm a big girl.' F: 'No, you're a little girl.' Y: 'I look after the little girl. *Well then* (emphasized) I'm a big girl.'

Again the evidence for a statement was spontaneously brought forward by

Y at 3; 9. F: 'Is S a man?' Y: 'Yes.' F: 'Is P (a friend) a man?' Y: 'Yes.' F: 'Is Q (a boy acquaintance) a man?' Y:

¹ As Spearman points out, such 'cognizing the relation of evidence is to be clearly distinguished from cognizing relation *by* evidence'.

'Yes.' Then spontaneously, 'They've all got trousers on and R and T (two other little girls) and I don't have trousers.'

This, of course, includes also an apprehension of difference; but I felt sure from the tone in which it was said that Y was offering it as a proof.

Early inferences or reasoning. The term 'reasoning' is used by psychologists if not by logicians in slightly varying senses. We may regard it here as concerning the process by which one proposition is inferred from another or others: not only the deduction of a conclusion from two premises or the induction of a general truth from particular facts but an inference from one known proposition or of one particular fact from another: and as psychologists we need not exclude fallacious reasonings, though of course it is of interest to trace the development of sound reasoning.

Many actions of the child before the age of 2;0 show that he can detect similarities and differences and act accordingly. But the generalizations of such terms as dog, man, etc., do not imply any inferences, as we have seen in the chapter on language.

In many early examples of apparent inference we cannot be certain there is a genuine inference. Some of our earlier examples of thinking about causes almost certainly involve inference: but we can only be sure when language reveals it. We have already had signs of crude inference by analogy at 2;0. Inference becomes more explicit and reasons for judgements are oftener given after 3 years. The last two remarks of Y just given are examples. Again, when B was 3;4 M said 'Go to sleep, or Wee Willie Winkie will come after you.' B: 'No he won't, 'cos I'm in bed and God is in bed with me too.'

Better examples of reasoning are given by both B and Y after 3;6, but before that we must consider the evidence of generalization which I obtained especially from Y at 3;0 and onwards.

Further generalizations from 3;0 onwards and their use in reasoning. We have seen that before 3;0 Y could form a generalization or summation about things familiar to her and limited to a definite group, all of which are present: e.g. 'You got a big mouth, Mummy got big mouth; everybody's got big mouths.' Even if we leave as uncertain the apparent generalizations, made before 3;0 by several children, that everything has a name or that everything has a cause, we soon come to statements about groups all of which are not present. Thus

Y, 3;0 $\frac{3}{4}$. F: 'Do you love Daddy?' Y: 'Yes.' F: 'Do you love S?' Y: 'Yes.' F: 'Why?' Y: 'Because I love everybody.' This, I think, is the first giving of a general rule to explain a particular.

3; 1½. 'Who do you love best?' 'Mummy and Daddy, S₁ and S₂, all the people.

3; 2½. An exception to a general rule was pointed out by Y. I said, 'You must not lick the butter off the toast.' Y: 'Why can't I?' F: 'It is bad manners to lick. We don't lick things.' Y, after a pause, 'But we lick ice-cream.'

At this stage I began to make special observations and tests of Y's use of generalizations or crude inductions. Thus I drew for her at 3; 1 four imaginary animals which I called Wagwums, with no nose, a very big mouth and only one leg; also four other animals called Foozles, with no mouth and no arms. As I drew each I talked thus: 'This is a daddy Wagwum; he's got no nose, but a big mouth and only one leg. This is a mummy Wagwum; she has no nose but a big mouth,' &c., and so on with each figure: but no generalization was done for her. Then similarly with each Foozle, 'Here's a daddy Foozle: he's got no mouth and no arms, &c.' Then at the end I asked 'What's the difference between the Wagwums and the Foozles?' Y: 'Oh, I know,' and then pointing to each Wagwum she said 'No nose, no nose, &c.' Then pointing to each Foozle she said 'That's a nose, that's a nose, &c.' It is significant, I think, that she fixed on *one* point of difference and did not merely repeat the characteristics of each kind of animal. A few months later I gave further more difficult tests, thus:

Y, 3; 5. I drew several elephants and told her that 'all elephants have trunks'. Y: 'Yes, I know.' Then I drew one like the others yet without a trunk. Y: 'That elephant hasn't got a trunk. Why? Hasn't he got one to draw?' F: 'All elephants have trunks.' Y: 'Make that one have a tail.' F: (monotonously), 'All elephants have trunks.' Y: 'Yes, I know all elephants have trunks. That one hasn't got one to live with.' F again, 'All . . . &c.' Y: 'Not that one: what is that?'

I drew another elephant without a trunk. F: 'Do all elephants have trunks?' Y: 'Yes: he has not got one though.' F (pointing to it): 'Is he an elephant?' Y: 'Yes.' F: 'Have all elephants got trunks?' Y: 'Yes'; and so when similar questions were repeated. Later I pointed to a complete elephant and asked 'Why is that an elephant?' Y: 'Cos he's got a trunk.' F (pointing to trunkless elephant): 'Why is that an elephant?' Y: 'I don't know.'

Y, 3; 5 (two days later). I again drew an elephant. F: 'What is that?' Y: 'An elephant.' F: 'How do you know?' Y: 'Because it has a trunk': and later—'elephants *must* have trunks'.

About elephants, however, there had been specific training, and I wondered if the idea of the essential mark of an elephant could be used in judging new objects. So I drew a hippopotamus

and asked: 'Is this an elephant?' Y: 'No.' F: 'Why?' Y: 'Cos it hasn't got a trunk.'

Y, 3;6 (eight days later). I drew three camels at her request, and then (without making any comment) one like them but with no hump. To this Y said: 'A little camel, it isn't a camel.' F: 'Why?' Y: 'It hasn't got a thing there' (touching her own back). (N.B.—I had not told her what a camel was like, and the word 'hump' was not mentioned.) So a common quality can now be analysed from a group.

Y, 3;5½. When an older girl friend fell down, Y ran up to her, kissed the place she had hurt, and then said in a tone of surprise, 'Mary, school-girls don't fall down!' Y, 3;6. I said I could not play because I was working. Y: 'Ladies don't work, do they?' Here is a general statement about objects not present:

Y, 3;7. 'Mans don't have belts or knickers, do they? Ladies do.'

Compare also the example already given above (under the Relation of Evidence, p. 446), when Y referred to males as having trousers and girls as not having trousers.

In accordance with the principle of intermittent development there are serious lapses, of course, into illogical thinking: e.g. F: 'Are all men fathers?' Y: 'Yes.' F: 'How do you know?' Y: 'Because I see them with glasses on.' I thought that this might be indulging in a bit of nonsense when the test became too hard: but some years later Y herself, when told of this remark, pointed out that she always saw me with glasses on: and she may have thought that older men are all fathers, and that all older men wore glasses.

Y, 3;10 (when riding in car, no reference having been made to driving): 'People like driving down hill and don't like driving up hill. I don't like pushing my pram up hill.' (Apparently an *inference from one particular to the general*, and if so the first noted.)

4;1. I made another attempt to get a generalization by drawing strange animals with tails on their backs, except one, which she noticed. I called them Tibbins. F: 'What can you tell me about the Tibbins?' Y: 'I don't know.' F: 'What have they all got?' Y: 'They've all got tails.'

I drew a picture of three brothers all with top hats. A and B each had a dog: C had a stick and so had A. I said, 'Here are three brothers. What have they all got the same?' Y: 'That's a dog and that's a dog. I don't know what that is?' (the stick of C's was curly). F: 'What have they all got the same?' Y: 'What? All caps. Do you mean caps?' F: 'What have they all got the same?' Y: 'I don't know what you mean': then looking again, 'Caps! they've all got caps.'

That affords another example, as at 3;6 above, that she can now *identify and isolate a common item*.

Y, 4; 1½: 'Can I go to town to-night?' (to see a procession). M: 'No.' Y: 'Yes. Little girls do.' (A general proposition used as justifying a single case.) When Y was playing shop, I told her not to take the cheese away. Y: 'People *do* take it away.' When putting away a wet umbrella, Y said, 'They must be opened, else they won't dry.'

Y, 4; 2. S: 'Don't suck your finger. Only babies do that.' Y: 'Babies don't. Barbara doesn't.' S: 'Oh, yes, babies do.' Y: 'Barbara doesn't. One baby doesn't.' Here an exception to a general rule is noted.

By this age she is also interested to find out about a common trait. Thus

Y: 'Has Snowball (our dog) got a tongue right back to his chest like us?' F: 'Yes.' Y: 'Have *all* dogs?' F: 'Yes.' Y: 'And cats and cows?' F: 'Yes.'

Y, 4; 1½. I said we would pretend I was taking her for a donkey ride. Y added, 'And mummy and S¹ and S²: everybody, *all except* the maids.'

Here is the making of an exception to a general statement: Piaget, by the way, says that few children under 7; 0 can use the word 'except' correctly.¹

The published records of children which I have quoted in earlier chapters provide very few notes on generalization or any aspect of reasoning at the early ages of 2 or 3. One of my collaborators, however, Mr. F. Lawson, H.M.I., gives me the following record of his daughter A. L. As her father was a house master in a Public School she saw only *boys* in school. At 3; 6 she asked 'When shall I be a boy, Mother?' 'Never: you will always be a little girl.' A. L.: 'But when I go to school I shall be a boy'; a good example of a fallacious induction owing to an incomplete knowledge of the facts. Mrs. Brash's J. at 3; 7 hearing some one say 'By the light of the silvery moon,' remarked 'All light is silvery, isn't it, Mummy?' Another boy of 3; 7 was taken by his parents to Kew Gardens: he was very interested in the blooms of the trees and asked what each tree was 'going to be'; several of them happened to be cherry trees; presently he said 'Oh, I see; *all* white trees are cherry trees.'² Sully says that his boy at 3; 4 'was getting more accurate in his thinking, substituting limited generalizations such as "some people do this" for the first hasty and sweeping ones'.³

There is also one interesting experiment on generalization by

¹ Quoted by Dr. V. Hazlett, in her article 'Children's Thinking', *Brit. Jour. of Psych.*, XX, 1930, p. 355.

² 'The Scientific Interests of a Boy in Pre-school Years', by Two Parents, *Forum of Education*, VI, 1928, p. 21.

³ *Studies of Childhood*, p. 458. Unfortunately Sully does not record the earlier generalizations.

a group of children aged 3 to 7, which is relevant here. Dr. Victoria Hazlett showed the children four trays holding the following objects respectively: (1) toy, dog and bird, (2) dog and pig, (3) dog and cow, (4) dog and sheep. In another set of trays, the trays had in common a match-box, and each also had some other different objects—man, hunter, can, goose. The first series of trays was shown to a child and he was asked 'What have all the trays got?' Later the second set of trays was used. Unfortunately Dr. Hazlett's record does not say how many children there were of various ages in the group of 83. But she states that the youngest child to solve the dog-tray problem was aged 3;2, while none under 4;0 solved the match-box series, though each child failing was asked to name all the objects on each tray and then asked again. (This was never helpful, by the way.) Dr. Hazlett thinks the match-boxes were less obtrusive, but I suggest also that the dogs would be more interesting.¹

Other types of reasoning at 3;6 and 4;0. From 3;6 and 4;0 to 5;0 we find further examples of reasoning, in addition to those in which a general statement is involved. Thus Sully's boy at 3;7 spoke of 'fairies going up in the air' and his father asked how they were able to fly. The boy replied: 'They had wings, you know. Angels have wings like birds and fairies are like angels: and so you see fairies are like birds.'²

Y, 4;3, asked the question, 'Who made God?'

Y, 4;3. Y was feverish. Nurse said 'If you take this powder it will put you to sleep and that will make you better.' Y: 'But I went to sleep last night and it did not make me better.' Y, 4;5, at night said, 'I've got so many pains. 'Tisn't with the cod-liver oil though, 'cos I had that at breakfast.'

B, 4;1, noticed in a picture some ducks swimming in a pond, and asked M if they came out of the ark. M: 'I expect so.' B: 'No, they didn't. M: 'How do you know?' B: 'Because there are three ducks and there were only two of everything in the ark.'

B, 4;2, when forbidden sugar and jam at supper for some mis-demeanour, began his usual grace—'Thank God for my good supper'—stopped and said 'Naughty God for my nasty supper.'

B, 4;9. B achieved the following after he had asked me what I did at the University. I tried to give a reason which he could understand and said, 'I talk to people who teach children and tell them how to teach children.' B: 'How do *you* know how to teach children?' F: 'Oh,

¹ Op. cit., p. 358. It is unfortunate that Dr. Hazlett did not give more details. Evidently there were great individual variations: for though she says 'very few children under five could pick out the common element' she adds that 'the realization of sameness in difference . . . in some cases does not come much before three years'.

² Op. cit., pp. 459-60.

some time ago I used to teach children myself.' B: 'How do you know how to teach children and not those people who teach children?' This acute pointing out of the weakness of my reason was a lesson in the danger of loose speaking when trying to descend to the child's level.

J. M. B., 4;9. Mrs. Barber's boy, J. M., who had been told that clouds bring rain, once asked, 'What makes the rain stop? There are still some clouds?'

By 5;0 and earlier in some cases, the general *idea that everything must have a cause* or source of origin may appear. At this age the question 'Who made God?' is a familiar one, and so are more specific problems of first origins, e.g. 'When there was no egg, where did the hen come from?'¹ Mrs. Brash's J. gives us another original example of a similar problem. She asked, at 5;5, 'If Helen caught my whooping-cough, and I caught mine from Billie, how did the first girl in the world to get whooping-cough get it?'

Reciprocal (or symmetrical) relations may also be grasped before the age of 4;0. Reciprocal relations are undoubtedly hard for the child to apprehend. Children of 9 tested by Piaget showed that they were not clear as to the reciprocity of the brother-brother relationship.² Yet it is wrong to suppose that the little child before even 5 or 6 cannot in any sense adopt the view point of another. For example, I noted that when Y at 2;8, sitting opposite to me, wanted me to see a picture in her book, she carefully turned it round so that I saw the picture the right way up.

Y at 3;9 said 'I'm going to put myself to bed. I'm my own nurse to-day.'

Y at 3;10 said that she wished we could have a new baby. F: 'A boy or girl?' Y: 'A girl. I'd be able to push her about and I'd be her sister.' At 3;10 I asked Y, 'Who is your brother?'—'Billie' (correct). 'Who is Billie's brother?'—'Randell' (correct). 'Who is Randell's brother?'—'I am.' (Perhaps 'brother' and 'sister' are not yet clearly distinguished.)

Y, 4;3. I drew three boys and I said 'These are three brothers. That (Tom) is John's brother: and that (Will) is John's brother. How many brothers has John?' Y: 'Two.' 'How many brothers has Tom (pointing)?' Y: 'Two.' 'How many brothers has Will' (pointing)? Y: 'Two.'

A clear grasp of a non-reciprocal relation (or asymmetrical, to use Bertrand Russell's term) was shown by Y at 4;6. M said 'David is younger than you.' Y: 'David is younger than me? Then I am older than David.' Also a week later: M: 'Harry's younger than you.' Y: 'Then I am older than Harry.'

¹ Sully, *Studies of Childhood*, p. 86.

² *Judgment and Reasoning in the Child*, Chap. III.

This is notable as being the first record of Y's handling of an asymmetrical relation. In Burt's reasoning tests those which involve such asymmetrical relations are only done, on the average, at about 6;6. But Burt's tests involve *three* persons: e.g. 'Kate is cleverer than May, May is cleverer than Jane; who is the cleverest, Jane, Kate, or May?' On the other hand, Y's remark was spontaneous, and in any case her mental age at 4;6 would be about 6;6.

When Y was 4;9 M said to her in error 'Be a good *boy*.' Y laughed and replied 'Well, you be a good *man*, and when *mummy* comes home be a good *daddy*!' Here is a threefold and consistent inversion of a relation.

Before discussing animistic thought and definitions after 3;0 and 4;0, we may consider briefly some evidence on several other aspects of thinking at this stage.

Communicating ideas. Piaget states that the child under seven is 'still egocentric and feels no desire to communicate with others or to understand them.'¹ My notes reveal that the desire to communicate appears at least about the age of 2, and as often as one might expect a child of that age to imagine it had something to report which a god-like parent did not already know. I note, for example, at 2;2, that Y repeated something 'over and over again in louder tones till I said "Yes," and so often in the last few months'. Nor is it merely the boasting report of what a child has done; e.g. at 2;11 she told me 'You got flies on your window, Daddy,' and repeated it in a loud voice as I did not reply. Again, my wife and I were once met, on returning home, by an excited little maid of 3;0 who reported to us, with a rapid and dramatic speech, a new fact just learned from a young brother, namely, that when we died we should be made into birds and fly up into the sky. The impulse to communicate may even become explicitly conscious before 4 years. Thus I heard one of my children at 3;10 shouting out 'Mummy, I've got something to tell you.'

Clearly the tendency to communicate will depend on the relationship between the child and others concerned. A friendly parent, brother or sister is one thing: a group of school children where rivalry or competition is strong is another.

Assuming a false hypothesis. Can a little child assume, for a time at least, a hypothesis it knows to be false? Piaget found that children of 8 and 9 would not do so. In the Binet absurdity test about the man who said 'If I kill myself, I won't do it on Friday, because Friday is unlucky,' Piaget said that the children, even of 9 and 10, 'refused to admit the hypothesis'.² Now undoubtedly,

¹ *Language and Thought of the Child*, p. 126.

² See *Judgment and Reasoning in the Child*, p. 65.

in such tests, children are attracted first by the (to them) most glaring absurdity. My boy of 7, for example, when asked what was absurd in what the man said, replied, 'The man would not want to kill himself'—quite right from the child's point of view. But certainly it is not true that children under 7 can never posit suppositions they know to be false, or that before the age of 8 or 10 they cannot assume a 'detachment from the view of the moment'. Thus at 3; 5 Y asked her mother to jump over the sofa. Her mother objected that she was too old, which brought the remark: 'If you was a little girl you could.' And again, about the same age, Y said, 'If mummy died, I'd be alone with my Daddy.' At 4; 2 Y tried to sit in her doll's pram but found it too small; she said, 'When I was a doll I could . . . If I was a doll I could.'

Records of such suppositions in the first four years are hard to find, though Stern reports (at 4; 3) 'Wenn ich das Hemdchen ausgezogen hätt, das wär doch auch schön.'¹ Before 3; 0 I can only find Sully's record of his boy at 2; 6: 'If him (a tree) would be small I would climb up.'²

Of course the use of the conjunction 'if' may introduce what is felt to be a *possible* condition; and then it may be used much earlier. Thus Mrs. Brash records that her girl J. M. B. between 2; 0 and 3; 0 used it fairly often in such sentences as 'If I go too near the fire, shall I be burnt?' and again when at 3; 3 she was shown Buckingham Palace and the sentry, and was told that he was guarding the King and how important the King was, she asked: 'If he (the King) saw me would he think I was just a little bit of food?' Mrs. Barber's boy at 2; 8 said: 'If I had a suitcase I would put it in the rack.' We can hardly say whether he thought that an impossible supposition: probably not. Some of the examples given above of Y at 3; 5 and 4; 2 (e.g. 'If I was a doll') are, however, obviously suppositions of what is known to be false. They are further examples of types of a thought-process occasionally taking place (when working in a familiar medium) some five or six years before the age at which it still fails sometimes to function effectively. The fact is that it is a mistake to make sweeping generalizations as Piaget is apt to do about what kind of thinking takes place in childhood and what in adulthood. Every kind of error which is thought particularly characteristic of children occurs also in adult thought; frequently in some adults, less frequently in others. I have found graduate students who, like Piaget's nine-year-olds, will refuse to posit an incredible hypothesis for the sake of testing the formal accuracy of a syllogism; and I

¹ *Die Kindersprache*, p. 79.

² *Studies of Childhood*, p. 441. ('Sixteenth month' is presumably an error for 'sixth month'.)

have known even a Fellow of the Royal Society to base a generalization about modern educational methods merely on his own experience when a boy contrasted with that of his two children of the present day.

What does seem to be especially true of the child of 3 or 4 years is that these various types of thought processes do occur only very intermittently at first: hence again the necessity of careful daily observations if the first appearances are to be noted. Furthermore, they occur in the course of the child's own everyday thought and experience. It is different when a direct question is put to the child. Thus when I gave Y a formal test to see if she could 'suppose', the result was as follows. (A few weeks before this test she had been ill for a time and had a good many new toys.)

Y, 4; 2. I asked Y, 'Suppose you could be ill again and have a lot more toys: but that if you were *not* ill again you could *not* have the toys. Which would you choose?' Y: 'Have the toys.' F: 'And be ill?' Y: 'No.' F: 'But suppose you could not have the toys if you were *not* ill?' Y: 'Suppose I *could* have the toys!' It is doubtful whether she knows what 'suppose' means or if she can fit the two alternative suppositions together. If she can it may be that a much disliked supposition cannot be entertained or will not be if she feels that it is an unreal one.

Definitions. By the end of the third year, and even before, not only are everyday concepts functioning efficiently in generalizations, but even more abstract terms are used correctly. Thus F: 'Did you do it on purpose?' Y (3; 1): 'No, it was an accident.' Also at 3; 0½, Y correctly uses 'little' and 'big', and often shows consciousness of contrasts such as 'I'm a little girl, S is a big girl.' 'M is a little boy, N is a big boy.'

Again (at 3; 1), when at breakfast she says 'I must finish my dinner' she hurriedly corrects herself with 'tea—breakfast'. But when asked she can give no sensible answer to 'Why is it not dinner?' or 'Why is it breakfast?' even when offered a sweet as a reward. That is, the correct usage of a word, and even the conscious self-correction of a wrong usage can occur without the child being able to state the grounds for using or not using the word, as of course often happens with adults.

At this period, however, an interest in the real meanings of words can show itself: the attention can be turned from the object thought of to the word expressing it: or a demand may be made for a meaning of words previously uttered as a mere formula. Thus B at 3; 4 began to ask, for the first time, the meanings of words; e.g. as to his prayers—'What does "God bless" mean? What does "Shepherd" mean?'

Y at 2; 10 became interested in the distinction between 'like' and 'love'. She used an inductive method to ascertain the meaning. Y:

'Do you love that man?' M: 'No, I like him.' Y: 'Do you love that car?' M: 'No, I like it.' Y: 'Do you love Daddy?' M: 'Yes.' F to Y: 'Do you love my stick?' Y (chuckling): 'Oh, no, I like it.'

Are the common words and names of everyday objects now so well understood as to be clear concepts? The earliest test we can give, as to a genuine awareness of the *basis* for a generalized name, is to try to obtain a good definition—making sure it cannot be one heard from another person. My earliest attempts to get definitions were as follow:

Y, 2; 10. F: 'What is a spoon?' Y: 'Tea.' F: 'What is a plate?' Y: 'Bun and bread.' This may indicate a mere association without expression of use, though the absence of the preposition 'for' does not prove that the relationship is not thought. Next day: 'What is a pram?'—'Black and brown.' 'What is a house?'—No reply till question repeated; then Y said 'Our home: that's a house' (definition by exemplification).

Y, 3; 5. Y was given, among other Binet tests, the definition tests prescribed for six-year-olds. (Y's mental age now about 5; 0.) Her definitions were all crudely functional or mere repetitions of the given word, the typical five or six-year-old reply.¹ 'What is a fork?'—'To get dinner.' 'A knife?'—'To eat dinner.' 'What is a cup?'—'A cup? A cup. Don't know what else it is.' 'What is a pram?'—'A pram.'

But a few days later the following conversation took place between Y and myself. Y: 'We've got a entry like Peggy, haven't we?' F: 'A what?' Y: 'A entry.' F: 'I don't know what you mean.' Y: 'You know—a little narrow road.' Here we have almost a proper definition—*per genus et differentiam*;—as though the mind even of a four- or five-year-old (in this case only 3; 5) when it is intent on explaining, and is keenly interested, may rise momentarily to a level typical of 7 or 8 years.

At 4; 0 all attempts at definition are still based on *use*.

'What is a fork?'—'For dinner.' 'A knife?'—'For dinner, and a glass is.' 'A cup?'—'For tea.' 'A pram?'—'For me to go in.'

At 4; 4, however, we find the words 'a thing' introduced into some definitions.

'What is a fork?'—'To eat with.' 'A knife?'—'A thing you put bacon on your fork.' 'A pram?'—'A thing that you can sit in and lie in.'

Three months later the beginnings of *description* appear.

¹ Kinds of answers typical of ages 6 and over are given by C. Burt in his *Mental and Scholastic Tests*, p. 42. Definition in terms superior to usage is there stated to be typical of ten-year-olds.

Y, 4; 7½. F: 'What's a fork?' Y: 'What you eat with—with lines on' (first use of a quality). 'A knife?'—'What you cut (? with) made out of silver things and a brown handle.' 'A cup?'—'What you drink out of.' 'A pram?'—'What you ride in.' 'A buttercup?'—'A flower (class).' 'A dandelion?'—'An animal—a flower—I don't know.' 'An elephant?'—'An animal.'

Here we see that (a) use, (b) description, and (c) crude classification, may all coincide at this age. The type of definition seems to be partly determined by the word to be defined: for classification (other than as 'a thing') first appears with things which have no obvious or regular use, e.g. buttercup, dandelion, elephant. But—'What's a donkey?' gave, not again 'an animal', but 'What you ride on' (as she did two weeks ago). Two weeks later, however, 'What's an animal?' (when she used the word) gave 'It crawls on four legs.'

Six months later, therefore, in the next definition tests, I decided to avoid the old terms and the most ordinary objects of common usage, and began with 'What is a motor-car?' Y, 5; 2½: 'A motor car—a motor and a car. Ask me what a fork is!'

'Newspaper' gave no better results, nor did a return to the common objects, 'fork', 'knife'. There may have been some fun or mischief here, but after another similar day I was strongly inclined to think that here was a stage at which the old definition by usage was felt to be unsatisfactory, yet a new type could not be devised. Thus to fork she said 'I don't know. I used to know, but I don't, you know.' Possibly here, as elsewhere, the apprehension of the desirable *form* of the definition outruns knowledge, and even adults may find the true logical definition of common words difficult for lack of scientific knowledge, as Mr. A. W. Wolters has pointed out.¹ He quotes the Concise Oxford Dictionary as defining 'dog' as 'a quadruped of many breeds, wild and domesticated'. My own dictionary looked a little better at first: 'A well-known domestic animal of many varieties closely allied to the wolf and fox.' Yet when I turned to 'wolf' I found 'a carnivorous animal—closely akin to the dog'.

To continue our tests:

Y, 5; 2½. One evening I told Y that I was only going to play a game she wanted if she answered one question well: otherwise she was to go to bed. (It was her bed-time in any case.) F: 'What is a window?' Y (after a long pause, looking at me): 'A pane or a window?' F: 'Oh, just a window.' Y (after another pause): 'I don't know,' and (sadly) 'Good night.' F: 'Well, I think you tried, so we'll have a game.'

Y, 5; 2½ (some days later). F: 'What's an elephant?' Y: 'An

¹ 'On Conceptual Thinking', *Brit. Jour. of Psych.*, XXIV, 1933, p. 135.

elephant' (not spoken as a question), 'I don't know.' F: 'Supposing I'm Ruth (aged 4), and say "I don't know what an elephant is; what is it, Y?"' Y: 'It's something with chairs on its back and a trunk.—Is that right?' F: 'It's quite good.'

Y, 5; 5. Y one day asked for a 'test' and said 'I know what a knife is.' 'What?' 'Something to spread butter and meat with.' So with the same word attempted at earlier ages the definition by usage remains—with the addition of 'something'. 'What is a rose?'—'Something to make the house pretty.' 'A hen?'—'Something that lays eggs for you.' 'A dog?'—'That's a hard one.' 'It walks on four paws; it barks too.' 'A cow?'—'Something that makes butter and milk for you.' 'A rat?'—'A nasty little creature.' 'A mouse?'—'A nasty creepy crawly thing. A rat and a mouse sometimes bite you.'

Note that where there is no utility, description comes in; and once in, it may recur in the next definition, even the definition of a useful animal. Thus: 'What is a pig?'—'A grunty thing that eats stones and coal and goes "hurr".'

At 5; 9 we get more definite examples of classification (*per genus et differentiam*), but still mingled with usage, especially when that is obvious: e.g. A tram is 'to ride in', a hammer 'to hammer nails in'; but

'What is a giant?'—'Somebody who is very big and wicked.' 'What is thunder?'—'When it is going to rain.' 'If a little girl said she did not know what thunder meant what would you say?'—'I'd say a big noise which shows you when it's going to rain.'

'What's an elephant?'—'Something to ride on.' 'But suppose a little girl said she did not know what an elephant meant, what would you say?'—'It's a *good animal* that lets you put chairs on it and ride on it.' (So a better definition appears when a practical need is shown.)

Sometimes this process of definition seems an uncongenial task. Thus at 5; 9 the following took place:

F: 'Suppose a little girl didn't know what a flower was and asked you, what would you say?' Y: 'I'd say, never mind! I'd say something pretty which smells nice.'

F: 'Suppose she said she very much wanted to know and would give you a box of chocolates if you told her, what would you say?' Y: 'It's something to look pretty.' (Pause.) 'Where's the box of chocolates?'

Y at 6; 0 had a tortoise, a valued pet—but of no use. 'What is a tortoise?'—'An animal that has a shell on top and a shell underneath.' (Probably her attention had been called to this latter curious fact.) At 6; 7, the definition is now still more exact: 'A pet animal with a very short tail and two shells.'

Clearly the logician's approved definition occurs more readily when there is no practical utility to encourage the fixation of the earlier definition by use. But all three kinds of responses (*a*) the mere puzzled repetition of the name of a familiar thing, (*b*) definition

by use, and (c) definition by class and differentia, may be given *on the same day* for different things.

Even two years later, definition by usage remains if the use is obvious, though Y's mental age is now about 12 ; 0. Thus,

Y, 8 ; 9. F : 'What is a fork ?' (Y was using one.) Y : 'What you use to push things on to your spoon.' F : 'What is an elephant ?' Y : 'A good kind animal that lets you ride on its back, and picks up little things with its trunk.' (I asked if she remembered being asked the question before and she said 'No'—and then with greater emphasis, 'Not fork.')

Of course in demanding exact definitions from children of this age we are asking for something which is not necessary for their own purposes or interests. As to strange animals, they want to know their peculiar habits or funny appearance—whether they are friendly or dangerous. As to many objects the use of the thing is, for children, and quite sensibly, the important thing. As is usual throughout the whole development of concepts and other aspects of thinking we get, broadly, first a practical efficiency in dealing with classes of things ; then the application of some term to the objects with inexact delimitations of the class ; then perhaps an awareness of the process of naming and grouping, and more exact expression in language of the experience of the object concerned. Only later comes the interest in and criticism of the expression as exact or otherwise (the work of the logician or scientist) and finally—a discussion of the *process* of the criticism, or of the expression—this highest work, of course, being that of the psychologist !

Some children can be interested in languages and expression at a surprisingly early age : but the dominant concern is with the things referred to, rather than with the form of expression. An example of this is the story I told of B (p. 419) when after my trying to explain what was meant by an elliptical sentence, he suggested 'This is Sunday' as an example, because 'not' was missed out, it being Monday !

Animism and Anthropomorphism in the idea of physical causation. While there is evidence that by 3 ; 0 or 4 ; 0 a child may have some idea of physical causation, there is no doubt that many, if not most, of his thoughts of physical events may continue to be animistic, and that in the narrower sense of anthropomorphic. His earlier vague ideas of outside events are no doubt still more narrowly based, as we have seen, upon his own experience of self as 'a cause', the origin of his idea of external force. (This is often described as 'egocentric' thought, a bad expression as it seems to me, for such thought is not centred in the self ; indeed,

a more apt but still unsatisfactory term would be the very opposite—ego-centrifugal.)

There is no need to dwell on the predominantly animistic thought of most children of even 5 or 6 when interpreting material events: though a recent report of one of my research students indicates that it is much less universal than Piaget holds, and that animistic interpretation is not so much characteristic of a given age as it is dependent on the nature of the particular event to be interpreted.¹ (This recalls the tendency we found in the process of defining.)

At the same time I want to emphasize the difficulty of discriminating at this early stage between a genuine belief of a child and mere play or make-believe. Take the following conversation with Y, 3; 2½, when I was driving her in the car.

F: 'Why does the motor car go?' Y: 'Cos it wants to go ta-ta.' F (later): 'Does the motor car like to go out?' Y: 'Yes.' F: 'Can it feel when you hit it?' Y: 'No.' F: 'They why does it like to go out?' Y: 'Cos it's lonely.' F: 'How do you know that it can't feel?' Y: 'I don't know.'

These are very likely genuine beliefs: but it is difficult to prove it. Certainly at times a child gives an obviously absurd answer—possibly for sheer mischief, possibly from the impulse to say something when asked a question beyond its capacity. Thus: F, to Y (3; 2½): 'Can a chair feel when you hit it?' Y: 'No.' F: 'How do you know?' Y (looking round): 'Cos Snowball (the dog) is here.'²

I am also inclined to think that there may be a touch of poetry rather than an animistic interpretation of nature, in the last sentence in the following remark made to me by Y after telling me that a brother had told her that there were bogies in the cellar. 'Angels look after you in the dark. The dark loves you, doesn't it?' (3; 7). Furthermore, we must bear in mind the commonplace fact that children of this age personify their dolls. Yet no one suggests that the child seriously believes her doll to be alive.

The decline of animistic thought in little children is, to a considerable extent, parallel with the growth and clarification of the concept of 'life', as well as the growth of the concept of self. I give here some relevant records on this problem.

¹ The research is recorded in a thesis by R. M. Askar and entitled 'Animism in Children'; it is lodged in the Library of the University of Birmingham.

² Piaget himself gives some examples of such 'random' answers: (See *The Child's Conception of the World*: Introduction). Compare also Wordsworth's Poem on 'How lying may be taught.'

Y at 3;9 shows me a flower and pulls off a petal. F: 'Does it hurt the flower?' Y: 'No.' F: 'How do you know?' Y: 'I don't know.' F: 'Perhaps it does hurt.' Y: 'No.' F: 'How do you know?' Y: 'Because it cries!' (meaning, apparently, 'It cries if it is hurt'). F: 'Did you hear it cry?' Y: 'No.' F: 'Shall we pull another one off?' Y: 'Yes.' F: 'You pull it.' Y: 'One, two, three, go,' and pulls. F: 'Did that hurt?' Y: 'Yes.' Here is inconsistency: but it only began after I suggested that perhaps the flower might be hurt.

F smacks the chair and says 'Can the chair feel it?' Y: 'Yes.' F: 'How do you know?' Y: 'I don't know.'

Some later conversations indicate Y's ideas as to what 'alive' means. Thus:

Y, 5;5. F: 'If I pricked you, would you feel it?' Y: 'Yes.' F: 'Why?' Y: 'Cos it would hurt.' F: 'If I pricked this chair, would it feel it?' Y: 'No.' F: 'Why?' Y: 'Cos it isn't a person.' F: 'If I pricked the tree outside, would it feel it?' Y: 'No.' F: 'Why?' Y: 'Cos it isn't a person.' F: 'If I pricked one of the hens, would it feel it?' Y: 'Yes.' F: 'Why?' Y: 'Cos it's a person—it isn't a person it is a hen.' F: 'Why would it feel it because it's a hen?' Y: 'A hen's a *little* person.'

F: 'If I pricked a dog, would it feel it?' Y: 'Yes.' F: 'Why?' Y: 'A dog's an animal.' ('A hen's an animal; I *think* this was added.) 5;5. F: 'Is the sun alive?' Y: 'No. It looks as though it moves, but it doesn't. Some one told me.' F: 'Is the moon alive?' Y: 'No. It looks as though it moves, but it doesn't.' Some days later I asked 'What does alive mean?' Y: 'I don't know.' F: 'Is a fish alive?' Y: 'Yes.' F: 'Why?' Y: 'Because it could move.' 5;9. 'How do you know that a dog is alive?' Y: 'Because it moves: *by itself*.'

Here Y applies the test of spontaneous movement as the evidence of being alive, the characteristic mark of children from ages 8 or 9 to 11 or 12 according to Piaget:¹ (Y's mental age would now be about 8;0 to 8;5). I had carefully avoided suggesting the evidence of life, but I cannot be certain that no one had done so.

The child's ideas about thinking. Some of Piaget's records of children's conceptions of thinking would delight the heart of a true behaviourist: for youngsters of 5 and 6 say 'we think with the mouth' or that 'thought is our voice' or 'air'.² (One recalls the symposium at Cambridge led by J. B. Watson on 'Is thinking merely the action of language mechanism?')

Here again, however, we are apt to get a wrong impression if we consider only the results of special questions put to the children: they must be supplemented by the records of spontaneous remarks.

¹ *The Child's Conception of the World*, p. 201.

² *Ibid.*, Chap. I.

The use by Y at 2; 6½ of the word 'think', already given above (when she asked what we were thinking about when we were quite silent) shows that she could not then 'identify' thinking and speaking as Piaget says is done by children up to the age of 6; 0 on the average.¹

In a remark of Y's at 3; 6 it seemed that 'thinking' was used as meaning 'imagining' as contrasted with 'knowing'. I asked her: 'Why do you think that ladies don't work?' Y replied: 'I don't *think* so: you *told* me.'

In such inquiries as Piaget's it is possible that the form of the question and the removal of the test from a concrete and interesting situation may make all the difference. Piaget asked such questions as 'When you are here and think of your house . . . what is it you think with?' If the question was not understood he added: 'When you walk, you walk with the feet: well then, when you think, what do you think with?' Here Piaget commits an error not altogether unlike that which he says the child commits when he replies 'With my mouth.' For we do not walk merely 'with the feet': the nervous system, including some part of the brain and an element of consciousness, if not actual volition, are involved. So the child's reply may not be so remote from the adult's as appears at first sight.

At the next stage, which Piaget places about the age of 8; 0, children say we think with the head or the brain: and Piaget thinks the description of thought as 'a voice inside the head' still shows the influence of the earlier stage. But surely for most people auditory images of the words thought accompany the thinking; and how can a child be expected to describe such auditory imagery better than as a voice in the head?

When Y was 3; 8 the following conversation took place.

F: 'Can you think?' Y: 'No.' F: 'Don't you ever think?' Y: 'No.' F: 'Do you think I'm Daddy?' Y: 'Yes. Oh, I'm thinking now.' F: 'What about?' Y: 'Reenie—I mean Peggy.' F: 'What do you think with?' Y: 'Mummy' ('with' probably confused with 'about'). F: 'You say you're thinking?' Y: 'Yes, I am.' F: 'What do you think with?' Y: 'A toy' (again 'with' equals 'about'). F: 'Where are your thoughts?' Y: 'At the shop.' F: 'Which shop?' Y: 'The sweetshop down there.'

A naïve imagination, we may say. Yet William James remarked that our thoughts while dynamically connected with cortical processes may be cognitively present with the stars²; and the poet wrote 'My heart's in the Highlands'.³

¹ Op. cit., p. 38.

² *Principles of Psychology*, Vol. I, p. 214.

³ Dr. H. Friedländer remarks that there is a common German saying, 'Seine Gedanken sind daheim' . . . 'His thoughts are at home.'

At any rate, in actual everyday conversation the word 'thinking' was used even before 3;0 as indicating some mental activity when the person was not speaking: and the usage continued after 3;0 and 4;0. Thus at 4;1½ Y spontaneously said: 'Do you know what I'm thinking 'bout Mary? I'm thinking 'bout the little dogs we saw.'

Nominal realism. According to Piaget 'nominal realism' reveals itself in the little child in that the thing and its name are intimately bound together.¹ Indeed, Piaget thinks that before the age of about 9 children actually confuse words and things. I cannot find his evidence convincing. What seems to me to be true is rather that the little child of, say 6 or 7, when asked questions about a name, cannot prevent his thoughts from running on to the thing; he cannot confine himself to the symbol. When Piaget sums up this section of his work by saying that 'Thought is regarded (by the child) as inseparable from its object,' it should, I think, rather be said that 'in the little child, thinking the words is inseparable from thinking of the corresponding objects'. There seems to me to be a fallacy here similar to that which Dr. D. H. McGregor once remarked to me was made by some idealists in metaphysics, in that they said 'we cannot think of the universe as existing without thought', whereas all they had proved, was that 'we cannot, without thought, think of the world existing'.

In the ideas of children at this early stage of 4 or 5 to 6 or 7 I suggest that it is not so much an explicit identification of thought and things (or of self and non-self, or of things and their causal consequences), but rather an absence of a clear distinction between them that makes the child say things which suggest such identification. For, as Piaget himself has pointed out, the little child will often endeavour to say something, even if it be nonsense and quite irrelevant, if you press him for an answer: and some of Piaget's own questions were decidedly suggestive: e.g. to the boy, Stei (5;6): 'Are the clouds' names the same thing as the clouds?' — 'Yes, the same thing' (p. 64).

The child's interest in its own thought and experiences. I was several times surprised at the early appearance of self-observation, and of curiosity about thought and experience. For example, once when B at 2;10 cried for something he said later: 'Why me cry?' and then supplied the answer himself. (This was in the midst of the period of many 'why' questions.)

A desire to know the meanings of the words he had for some time used in his evening prayer was shown by B at 3;4 when he asked 'What does "God bless" mean?' X at 2;5, eating some chocolate, said 'I love it'; and then vigorously turning to her

¹ Op. cit., Chap. II.

mother—'Don't I love it?' (A psychologist colleague who was present said, 'She must be a Behaviourist!') Similarly Mr. Williamson's daughter E at 2;4 said, 'Margot likes jam. I like jam . . . don't I?'

C at 4;6, when he saw his mother unpacking some silver presents sent by an aunt, asked, 'Why do I like to see them come, Mummie?' B at 4;10, when some one mentioned 'pastry-cakes', said 'I could smell the smell that pastry has when you said that.'

Y at 4;11 one day was rapidly blinking her eyelids. Suddenly she cried out: 'I can see with my eyes shut.' F: 'What do you mean?' Y repeats her statement. F: 'What can you see?' Y: 'Everything when I am blinking. I can see all the time.'

All other members of the family say this had never been pointed out; and it sounded like a surprised discovery. Of course, with rapid blinking the visual impression would appear practically continuous.

The use of 'but' and 'although'. According to Piaget the correct use of 'but' as a conjunction between two sentences and implying an 'implicit discordance', occurs only round about the age of 7;¹ while 'explicit discordance' with the correct use of 'although' he thinks is probably not understood before 11-12 and at any rate not before the age of 10.² Here again, however, we find that the first appearances of such usages occur much earlier than Piaget says. My first record of 'but' is this:

Y at 2;8 $\frac{3}{4}$ in bed at 8 a.m. F: 'Don't suck your finger.' Y: 'But I'm in bed and asleep.' (She was at that time allowed to suck her finger on going to bed.) Here 'but' introduces the exception to the general rule that finger-sucking was not allowed.

My first records of 'though' in the simple sense of 'but' were these:

Y at 3;5. F: 'Do all elephants have trunks?' Y: 'Yes. That hasn't got one, though.' Y, 4;3. When I had failed to put the top of a musical box round the outside, I said to Y, 'I can put it inside.' Y: 'You can put it inside, though.' (I did not use the word myself.)

Mrs. Brash's J. M. at the early age of 3;0 spoke the following sentences: 'I want to go out, though it's raining.' 'I want to go to London, though I have a cold.'

This is extraordinarily early: but I had asked Mrs. Brash to be on the look-out for this and other conjunctions. I was not specially on the look-out for it myself in either B or Y.

We have to bear in mind that other words may be used to

¹ *Judgement and Reasoning in the Child*, p. 50. Piaget adds 'actually from the age of 6'.

² *Op. cit.*, p. 46.

express discordance. My daughter assures me that her nursery school children (ages about 2;0 to 5;6) never use 'although', but would say 'Fancy! He does that when (= although) he's a boy.' One may hear adults say 'Fancy him doing that when he's a boy.'

The naïveté of the child. The right functioning of thought processes depends, as we have seen, on (a) adequate familiarity with the subject matter, the fundamental concepts involved, and (b) strong interest in the solution of the problem. When these coincide we get surprisingly effective thinking at an early age, though at first these occasions are rare.

But the child himself, like most adults, is apt to interpret the unfamiliar in terms of material with which he is familiar, if there is sufficient resemblance. This is where wider experience and knowledge help. A high intelligence quotient cannot make up for lack of it, and the naïveté of the child follows from such lack of knowledge, not from lack of capacity in the various mechanisms of thinking. It is thus that we often find a remarkable combination of acuity and naïveté in the thinking of the child. Thus when Y was 6;0½, the following conversation took place: Father to Mother: 'Do you think we shall have any more frost this year?' (an absurd question, by the way). Mother: 'I don't know; no one can say.' Y (breaking in): 'Not even God; He might change His mind.'

CHAPTER XXII

Some Special Abilities and Ideas

We have seen in the last chapter that space-relations were clearly expressed by B and Y at the age of about 2 ; 0 and that various other relations were expressed during the period 2 ; 0 to 2 ; 6. We shall find that time-relations were expressed at about the same age, by both B and Y, and that the period of around 2 ; 0 was also very important for the beginnings of apprehension of number. Here again we must recall that the mental age of these children at the age of 2 ; 0 would be about 2 ; 10.

THE APPREHENSION OF IDEAS OR RELATIONS OF TIME

One of the first essentials for the emergence of an idea of time is the ability to retain and recall past impressions (which I have considered in the chapter on Learning and Remembering), which further implies the simpler capacity to think of an absent object. Even more primitive elements are that 'direct experience of time-transience' (which Stout refers to in his acute analysis of 'temporal perception'), and that rudimentary anticipation of a coming event, that forward looking of attention which he calls the 'not-yet' consciousness, experienced, for example, by the child who sees the preparation of his food.¹ The first signs of such first raw material of the idea of time we might indeed find in the baby's eager grunts of pleasure at being placed in position to feed. It is later, however, where the child can hold in mind the thought of some past experience and realize that it is past, or can think of some experience which he knows is to come, that we should expect to find the direct stimulus to the emergence of ideas of time as such, aided without doubt by the speech of adults around.²

But to think of an experience which is past, or of an object which is absent, is not identical with having an idea of time proper. For evidence of this, as of other elements of thought processes, we must rely chiefly on the use of words referring explicitly to time, used in contexts which suggest that the child really understands their significance. It will be noted that these began in B and Y about the age of 2 ; 0, and in the chapter on Learning

¹ *Manual of Psychology* (5th ed., 1938), pp. 496 and 498.

² This latter point is especially stressed by Dr. M. M. Lewis in his article 'The Beginnings of Reference to Past and Future in a Child's Speech', *Brit. Jour. of Educ. Psych.*, VII, 1937, p. 39.

and Remembering we saw that by that age, interesting events can be recalled after an interval of several weeks.

Stern found that with his two children the earliest time-words referred only to the Present and the Future, never the Past.¹ My own earliest notes about B's ideas of time show that references to the present are almost immediately followed by references to the future and past.

2; 0. Uses 'now' correctly; when I told him he could have a cake after milk he drank his milk and then said 'Now cake?'—so on several occasions.

2; 0½. He has used 'now' correctly for a week or more. I make him finish his milk before he has any bread and jam, and when he has done he says, 'Now, bed-dam.'

This use of 'now' may have a reference to the immediate present, or at least be equivalent to 'next'. If it be suggested that it is merely a request word, it is difficult to see why the word 'now' came to be used.

B, 2; 1. Is quite satisfied often if told he can have cake, &c. 'by and by', or after his porridge, and then he remembers to ask for it, saying 'Now cake.' This certainly seems to imply that he understands the meaning of 'by and by'.

2; 1. Uses 'be' (been) to make the past tense: e.g. 'Daddy be ni-ni' (been to sleep), 'Daddy be s'ave (shave)', &c. Thus 'been' seemed to be generalized for past time, for he often says 'B be ni-ni' (B been to bed).

It will be seen that with B the first use of the word denoting the present ('now') is very shortly followed by the understanding of 'by and by', and almost coincidently by the use of the past tense 'been'. Soon there was a striking bringing together of the ideas of past and future. Thus:

B, 2; 1½. (When I told him to lie down in his cot) 'Been ni-ni.' F: No. B not been ni-ni. Lie down. B: By and by B been ni-ni.

If it is doubted whether 'by and by' here really refers to the future we must recall the occasions when having said it (e.g. 'By and by have cake'), B said, after fulfilling the condition, 'Now have cake'. Also at 2; 4½ B said, 'Not by and by! Now!'

B at 2; 2½, when asked 'Whom did you see last night?' replied correctly 'Unkoo' (uncle). B, 2; 6, used 'last night' several times; but one of these was incorrect: he said he was in the sea 'last night' instead of 'yesterday'. B, 2; 6, said 'B went ni-ni (with) Mummie last morning': this was true if 'last morning' stands for 'yesterday morning'. B, 2; 9, when asked if he had been in a certain field before,

¹ *Die Kindersprache*, p. 55.

said, 'Not for a long long time'—which was true. But he sometimes uses this phrase about something which happened a few hours before.

The last note of B before 3;0 shows the extension backwards of the idea of time. At 2;9½ he mentioned something which had happened. I said 'When? Last night?' B: 'Not last night, 'nother night' (It was the night before last).¹

Now let us turn to Y's *record* for the same period—2;0 to 3;0. Her use of time-words began at precisely the same age.

Y, 2;0¾, said 'Go (with) May (thi)s' afternoon'; this is the first 'time-word' I think, though a friend reports that she said 'I coming soon.' Y, 2;1½. When I came down to breakfast M went out as usual to fetch coffee. Y said, 'Mummy come back in a minute—bring Daddy's coffee.' Y, 2;3. When told not to touch things in a drawer Y said 'I'm going 'shut it in a minute.'

With Y the time gap between the expressions for the immediate future and a word referring to the past was much greater than in B's case. I may have missed one, but I was looking out for them. The first word referring to the past was at

2;11. 'I had such a nice tea in the drawing-room last night' (yesterday afternoon). Referring to our coming summer holiday at the seaside she said 'When I go to Cromer.'

3;0. Ten days after the holiday at Cromer I asked Y, 'When were you at Cromer?' At once she replied 'Yesterday'; then archly 'To-day' with a laugh. Y, 3;0½, asserted we should be made into birds and fly to the sky. When asked when we should do this, she replied 'Oh, a long time ago.' (Apparently 'ago' means from now forward.) 3;1. 'There was a big man on my ottoman *yesterday*' (referring to Guy Fawkes placed on her ottoman eleven months ago). 3;1½. On seeing a friend she had not seen for six months, Y said 'I saw that man *a long time ago yesterday*.'

(We may recall that B at 2;9 used 'a long time ago' for a period of a few hours and also for one of many days.)

So the terms referring to the past are still very hazy: and so are some of the future terms; e.g.

Y, 2;11, looking at my bed which was without a pillow, said 'Will Daddy have a pillow to-morrow night?' (apparently 'the later on night' as though 'to-night' was not late enough). When she was going to bed, I asked 'When will you get up?' Y: 'I can't tell you.'

¹ I may add to B's records the report of a short test (as a sample experiment) I did at 2;4 to see if he could learn to understand 'slow' and 'quick'. I set a metronome beating at 60 to the minute and said to B 'That's *slow*.' Then I set it at 170 and said 'That's *quick*,' and so three times each. Then I turned the metronome away from him and tested him three times with each speed, arranged haphazard. With each speed he was right twice and wrong once.

Some temporal expressions at least first come to be understood as having *something* vaguely to do with time—past or future. Only later and gradually do they acquire their more exact meaning. So with Preyer's son, who at 2; 6 and for a long time after, used *Heute* (to-day) and *Gestern* (yesterday) indiscriminately as alternatives—just as he used *Zuviel* (too many) for that idea and also for *Zuwenig* (too little).¹

Similar vagueness and ambiguities continue after 3; 0 and 4; 0. Even such an exact term as 'half an hour' may be used in a vague sense; e.g. Y at 3; 6 said 'We'll go in half an hour,' which she could certainly not properly understand, and no one had just been using it so it was not just meaningless imitation.

Y at 4; 1 said 'I did that years ago.' At 4; 2½ I asked her 'What does to-morrow mean, Y?'—'The next day.' But she could not explain what 'yesterday' meant. Y at 4; 5, 'We're not going to-morrow but to-morrow to-morrow' (i.e. the day after to-morrow).²

B at 4; 3½ rose for a moment to an unusually high level of achievement. He used correctly 'the day after the day after to-morrow'. I think it was in answer to the question as to when the next Sunday came. He may have reckoned first by the names of the days (which he knew), but even so it was a complicated thought.

THE APPREHENSION OF IDEAS OF NUMBER

Studies of the development of ideas of number in children have been almost entirely confined to children of 2 or 2½ years or over. Even Stern in his comprehensive book begins his discussion of the 'sense of number' at this stage,³ and Mlle Alice Descoedre's excellent description and reports of number tests refer to the ages 2½ to 6; 0 except for one test given also to five children of 2; 0.⁴ But the beginnings of the apprehension of number may come much earlier than 2; 6 or even 2; 0, at least in some children above the average intelligence. I made careful observations on the first

¹ *The Development of the Intellect*, pp. 173 and 178.

² Professor Burt comments: 'You have here provided an instance which I think ought to become classical. It seems to me that at that moment Y had suddenly appreciated the fact that the relation denoted by 'to-morrow' is at once an asymmetrical and a transitive relation so that days can be arranged in a serial order as a result of the relation of to-morrowness between each successive pair. It is interesting that at 4; 2½, though she could explain to-morrow, she could not twist the asymmetrical relation round and explain what is meant by yesterday.'

³ *Psychology of Early Childhood*, p. 413. Preyer made some earlier observations, but I agree with K. Bühler that Preyer's idea that his child at 0; 10 could tell if one of his nine ninepins pins was missing sounds highly improbable. It is likely that the child's behaviour was misinterpreted.

⁴ See *Developpement de l'Enfant de deux à sept ans*, Chap. 8.

signs in B and Y, and I give below the records in detail—at the risk of being tedious; but only by giving a fairly complete record can one show the gradualness of the learning even of the correct use of ‘two’. The records also give, it seems to me, a good example of the futility of trying to teach a child something when the requisite functions are not sufficiently mature, especially if one compares the long process with the speedy learning of geometrical figures to be described later. It is desirable to keep in mind throughout five distinct things:

(1) The mere impression that there is a ‘moreness’ or ‘lessness’ in a group of things compared with what it was before, or with another group; (2) the learning of the names of the numerals without understanding their meaning, as one might learn nonsense syllables; (3) the learning to count, associating each number with one thing in a series; (4) the apprehension of a group of two things as distinct from one or three, and the knowledge that such a group is labelled ‘two’ (and so with three, four, &c.); (5) the realization that when one has counted a series of objects, e.g. ‘one, two, three, four’, the last word gives the *total* number of objects in the group.

B, 1; 2½. I took him three large sea-shells which were new to him. Great pleasure shown. I then put them behind my back and brought forward two only—one at a time. He took them, put one down, and held out a hand at once and asked ‘Ta?’ ‘Ta?’ till I gave him the third. Then no longer asked ‘Ta?’ ‘Ta?’ All this repeated exactly. The third time, however, he was content with two. 1; 3. Gave him three pegs, exactly alike, to play with; then I put them behind my back and gave him two again; he repeatedly asked for the third, holding the other two in one hand. All this repeated three times with same result. Tried with four pegs; but he did not ask for the fourth. Repeated, but he threw the pegs about. 1; 3½. B had three pegs all alike and gave them to me. I held them in my hands behind my back and returned them to him, one at a time: he was not satisfied with two, said ‘Ta?’ ‘Ta?’ for third. But with four pegs he was (twice) satisfied with three pegs, though just previously I had put two in each of his hands.

So far it seems probable, though not certain, that B can already realize the difference between two or three objects of the same kind. It must be borne in mind that B’s mental age would now be about 1; 8.

From at least 1; 7 B’s nurse began to count to him, and I began to try to teach him the meaning of ‘two’. The records will show the long process involved, and the ups and downs of progress before, at about 2; 4, the use of two is fairly grasped, though still shaky at times.

1; 7½. Follows my ‘one’ with ‘oo’. The nurse has said when putting him to bed, ‘One, two, three.’ But I could not get him to say,

'One, two, three' with each of three apples as I gave them. B apparently missed the fourth apple when he had three in a round fig-box; he looked round for it. 1; 8. When nurse says 'One' . . . he now touches his fingers and says 'oo' (two), 'ee' (three), but does not go on to 'four, five'. To-day I tried to get him to say all five, but he only said 'oo, ee'; he repeated this and then waved his arms and shouted, as I have previously seen him do, as though letting off steam after mental effort. 1; 9½. He had been playing with my two pencils to-night, and when they were put away, he wanted to kiss them good-bye. I gave him one, but he was not satisfied and said, 'Two,' until he got the other to kiss too.

I have had two other instances of the use of 'two' meaning 'the other one'. B kissed one kitchen chair and then said 'Two, two,' until he had kissed the other one; so again with two of my fingers.

B, 1; 9½. He ran alongside his bricks arranged on the floor saying 'Two' 'ee' . . . so 'two-three' now seems associated with a series of similar things.

1; 10 (d. 664). B had a drink from a glass; when he put it down he pointed to the only other glass on the shelf and said 'Two-ee.' Here he uses 'two-ee' with a different object: i.e. glasses instead of pencils or fingers, 'two' or 'two-ee' seems at least to mean now 'another of the same kind'.

1; 10 (d. 664). I think he said 'Two' in asking for a second pencil (he had had two before when I gave him one). He also said 'Two' in asking for more bread and butter, when some had already been given him. If he now uses 'two' as similar to 'more' or 'another' it is of his own learning; we have only taught him to count buttons, fingers, &c.

1; 10 (d. 668). Spontaneously said 'Two pay-ee' (people) to-day, when he saw two. Also 'Two chai(r)' when he placed two together by the wall. d. 673. Said 'Two gee-gee' when he saw a group of three horses. 1; 10½. Experiments with pencils. I give him one pencil. B says 'Papy (pencil), Daddy, papy' over and over again. I show him two pencils and say 'Two pencils.' B repeats 'Two papies.' I show him three, saying 'Three pencils.' B repeats 'Three papies.' When given three, B said 'Two papies.' He still seems to use 'two' for 'some more' or 'another' of the same kind.

1; 10½. I prepared small cards with one, two, three or four strokes on them. I taught B for a few moments which was one and which was two. I then asked him for 'two' and he gave me the right card; when asked for 'one' he also gave the right card. I gave him further instruction, but was then unable to get him either to say 'one' or 'two' correctly when I showed him the corresponding cards. Nor when I asked for 'one' or 'two' did he give me the right card. He has got so into the habit of saying 'two' after 'one' that when taught 'one' he immediately says 'two'.

2; 0. Was saying 'two-ee gases', 'two-ee gases', &c., looking and pointing to the various gas brackets. Apparently 'two-ee' (as I have all along thought) may also mean vaguely 'several'. I tried him with

2; 2. I showed B a picture of three women together; B said 'Two maba.' Also said 'Two' when there were only two. To a group of several women said 'More maba.' I said 'Count them'; he said 'One, two, six,' pointing to three in succession. d. 791. Has recently said 'Two' spontaneously and correctly several times. This frequent repetition of a new word within a few days suggests that the idea is being apprehended.

d. 793. Saw three pennies on table. Asked for them, 'Ta Daddy—two'; as I gave him one he repeated 'Two.' I gave him a second, B said again 'Two.' I said, 'No, that's not two.' 'O(ne)' he said now.

2; 2½, d. 809. I showed him five ducks in a picture, and told B to count them. He counted carelessly, 'One, two, three, four, five' and ran on to 'six'. I said 'No, count carefully.' He counted again, now pointing to each correctly and stopping at five. B was looking at a picture of three boys. I asked, 'How many?' 'Two boys'; 'No, count.' B said 'One, two, three' (and I think ran on to four, five, six). Next time he stopped at three, saying, 'One, two, three—*three* boys.' N.B.—This is the first time the last number spoken in counting is applied then and there to the group, except for the number 'two'.

2; 2½, d. 811. Showed him four soldiers. He counted the soldiers 'One, two, three, four,' as I pointed to each; but when he did it alone he went on to 'six', though there were only four soldiers there. When I reduced the number to three and said 'How many there?' he counted 'One, two, three,' and then when I again said 'How many?' he again said 'One, two, three,' showing no grasp of three as alone indicating the three. But when I said 'This is a black horse; this white; this brown and this brown,' he at once said spontaneously, 'Two bow gee-gee,' showing the readier use of 'two'. d. 818. I gave him three pennies; he counted, 'One, two, three.' 'How many pennies have you?' 'Three.' This is the first use of three in this way: but it may be a chance hit.

2; 3, d. 825. Counting three pennies on table. B took one at a time and counted each—'One, two, three.' As he noticed the king's head B said 'Daddy.' Noticed another penny had the king's head and said 'Two, Daddy.' I said 'How many pennies?' He said 'Ee pennies.' A further *right use of three even without counting* immediately before.

d. 830. Never gets numerals mixed up now in counting; always says 'One, two, three, four, five, six' correctly.

d. 837. I am trying to teach him to understand the number 'four'. Gave him four pennies, but though some days ago he was able to say how many he had when I gave him three (saying 'One, two, three,' and then 'three pennies') the fourth now quite bothered him; e.g. he *would* go on to six. He never counted 'One, two, three, four,' and then said 'Four pennies.'

Apparently so far each number as meaning a group has to be learned separately, the *principle* has not yet been grasped.

2; 3½, d. 841. Uses 'two' now spontaneously and correctly (but see later). Suddenly began again to do so a few days ago: but he does not

yet use 'one' correctly when one object is removed; he may say 'three', then 'two'.

2; 4½. B said 'Two boats' correctly when two boats were sailing in the bath, yet when I asked him how many boys there were in a picture (there were two) he never gave a correct reply, but said 'One, two, three boys.' M reports that when asked for one clothes-peg, B gives it correctly, but when asked for two brings a lot. To-day, B once brought two correctly, but that may have been by accident. Counts 'One, two, three, four, five, six chairs.' 'Three' as signifying a group is still unlearnt, in spite of some successes over a month ago.

About this age I noted also of X and A (both of whom had less regular training in counting and less frequent tests) the correct *spontaneous* use of 'two' earlier than its use in reply to questions.

X, 1; 11½. Has correctly used 'two' *spontaneously* for several days. X, 2; 3½. Uses 'two' correctly spontaneously: but later still does not answer correctly when two fingers are put up, and she is asked 'How many fingers?'; says 'five' or 'one', &c., at random.

A, 2; 6½. Uses two correctly and spontaneously at table: 'I'ot two (spoons).'

When I put one finger and said 'How many?'	A said 'One.'
" " " two " " " " "	" " 'Two.'
" " " one " " " " "	" " 'One.'
" " " three " " " " "	" " 'Two.'

When I said 'No,' A said 'Five.'

When I said 'Count,' A said 'Two, four, five.' I tried to teach him 'three', but later he again said 'two' for three fingers.

Thus in each case observed, A, B and X (and we shall see shortly the same was true of Y), there was a stage in which two was used correctly when spontaneous, but its use was uncertain when tested by the question 'How many, &c.?' Possibly the keener interest which prompted the spontaneous use, resulted in a momentary higher level of mental efficiency enough to raise this nascent function to effectual working.

In addition, however, we have to bear in mind the distinction between (a) apprehending two things as a group and naming the group 'two', and (b) the process of counting which is started by the question 'How many?'

B, 2; 6. When given the four-year-old Binet Test B readily repeats three non-consecutive numbers, e.g. nine, three, six. Has done three out of four tests correctly. But four numbers bother him at once and then he does not even get the first three right. 2; 6½. Three pennies on table, I said 'How many?' 'Three, four pennies.' 2; 8. Counted 'One, two, three, four, five bikeys' (biscuits) correctly. 2; 9. When counting six pennies held the last one up and said 'This six.'

2; 9½. Uses 'three' *spontaneously* correctly now, but not always

correct when tested with my fingers. B drew two dogs, and said 'Two doggies.' Then he drew another and without counting said, 'There's three doggies.' Also said 'Only three ladies,' when he found three visitors in the drawing-room—no counting.

It should be noted that some six months has passed, in spite of constant teaching and practice, between the correct use of 'two' and the corresponding use of 'three', a fact also noted by Stern.¹ This is further evidence of the importance of maturation, and supports Binet's view that special early training has not always the effect one might expect on the results of some tests.

B, 2; 10½, counted spontaneously up to four to-day. When showing a younger child his ducks and pointing to each in turn, B said 'One, two, three, four—four quacks-quacks, darling.' (We may recall that counting four pennies, and then saying how many there are, is a Binet test for 4; 0, which again precisely fits in with B's I.Q. of about 140-145.)

B, 3; 1½, counted eight donkeys each with a boy on its back: but he could not say how many boys there were after counting the donkeys. I said, 'Suppose you had two plates with a cake on each, how many cakes would you have?' B, 'Two'; and so with three. Then I tried a row of four donkeys. F: 'Here are four donkeys and a boy on each; how many boys?' B again started counting the boys! (Of course the donkey-boy 'situation' would not be as familiar to B as plates plus cakes.)

B, 3; 3, has a passion for counting now. Counts numbers on his fingers: e.g. if we say he can have three biscuits he makes me count 'One, two, three' and then does it himself. He can count about twenty on his fingers and mine, but usually forgets the numbers twelve and twenty.

Y's development in the understanding of number. This remarkable increase in B's interest in counting at this period probably indicates a sudden maturation of the abilities needed for the understanding of counting and numbering: and by now we seem to have the correct use of 'two' and 'three' and the occasional use even of 'four' as meaning a group. This may therefore be a convenient place to insert, for comparison, some notes on Y. They illustrate several points already exemplified in the notes on B, especially:

(1) The very gradual acquisition of the concept of 'two'; the word is used occasionally at 1; 7 and yet errors are still made in its use at 2; 6.

(2) 'Two' is correctly used *spontaneously* before it can be used in response to the question 'How many?' and the showing of two fingers.

(3) There is a similar long interval between the correct use of 'two' and the corresponding use of 'three'.

¹ *Die Kindersprache* (4th ed., 1927), p. 283.

Y, 1; 7½, put a sock on a chair, then another beside it and said 'Two.' I was surprised. She then got a brush; M gave her a second; I asked for one; she gave me both; took them back, put one on floor and said 'Two.' M got her a box of matches, and Y put it on the floor: then M gave her another box: she took it, saying 'More matches' (plural used) and put it by the other and said 'Two.'

1; 11. Playing with a kitten in a shop. A dog joined in. Y: 'Oh, mummie, two.' M: 'Two kittens?' Y: 'Two kitty dog': a *correct spontaneous use of two*. She is learning to count now. M heard her nurse say 'One, two' (pause) and Y added 'Three.'

2; 4. I drew two cats and asked her 'What are these?' Y: 'Pussies.' 'How many?' 'Two of them, meow.' I now drew a third cat and said 'How many now?' Y: 'Two pussies.' I said 'No, three.' I drew two birds and asked 'How many dickies?' Y: 'Two; there's two of them.' I drew a third and asked 'How many?' Y: 'Two.' I said 'Count.' Y: 'Nine, three, eight!'

Thus 'two' is apparently used for more than one.

I put up four fingers and asked 'How many?' Y: 'Two fingers.'

" " one finger " " " " " " Y: 'Two fingers.'

I drew three cats and asked 'How many pussies?' (pointing to one and covering the others). Y: 'Two pussies.'

(Does the question 'How many?' inevitably prompt the answer 'Two?' Major found this in his boy R at 2; 0—however many objects there were.)¹

2; 4½. I doubt if 'one' is any better understood than 'two'. Of course 'one' is not often used by us in speaking to Y, and is never used by Y herself, so far as I know; whereas Y sometimes does spontaneously use 'two' correctly: e.g. Y saw two kittens and said 'Oo, two pussies.' But when tested again to-day with fingers and hands she said 'three' for 'two' more often than she used 'two'. And when I asked 'How many pussies?' (showing one cat) she said 'Two'—and then 'Eight'! (The premature attempts to teach her 'three' seem actually to have caused greater confusion with 'two', which is sometimes actually used for 'one'.)

2; 5. Y still cannot say how many hands she has; she guesses 'four' or 'five', &c. When M put up one hand and said 'How many?' Y said 'Only one'—and so again; but when M put up both hands Y said 'Four', 'Five' or 'Nine'! Again M put one hand up; Y said 'Only one,' and so again. (N.B.—This use of 'one' is not spontaneous.) Two days after this test Y spontaneously used 'two' correctly: looking at the table she said 'You got two butters.'

2; 6. Again Y spontaneously used 'two' correctly—'Shall I have two ribbons?' Yet a day or two ago number tests again showed hopeless confusion.

2; 9. Y counted correctly to four, but was wrong twice when I put

¹ *First Steps in Mental Growth*, p. 167.

up three fingers and asked 'How many fingers?' She did three tests about two fingers correctly at once. When three fingers were put up Y counted 'One, two, three, four, five.' Again I put three fingers up; Y counted 'One, two, three, four.' M put up three fingers, and when Y counted to 'three' M said 'Right': and so a second time. The next time, when I put up three (and did not speak when she got to three) she stopped at three. But a quarter of an hour later she again counted beyond three. Then I told her to touch my fingers as she counted and twice she did 'three' correctly. So in *counting four fingers; she is correct so long as she touches each*. Tested again with three fingers without touching, she failed again.

3;1. Y looking at picture of house; there were two dogs; she certainly noticed and talked about them. But when I said 'How many dogs?' she said 'Three' and then 'Three, four, five.' Yet often she has used two correctly spontaneously.

Apparently the query '*How many?*' still suggests to her merely the number series, and she replies sometimes with several numbers: often she fails to answer right when there are only two objects.

3;1½. A group of ten matches were on the table. I said 'Put two matches there' (pointing to a separate place—A). Y selected two correctly. 'How many there (at A), Y?' 'Three'! Then Y put one back, held one up and said 'One, only one now.' I said 'Give me one match.' Y gives me one. 'Put two matches there.' Y puts two there. 'How many there?' Y: 'Two matches.' 'Put three matches there.' Y puts two there. 'How many there?' Y: 'Two.' 'Put three matches there.' Y takes two and says 'Those are three, aren't they?' I put two matches and say 'Count them.' Y (without pointing) says 'Two.' 'Count them.' Y, pointing, 'One, two, three!' Again I put two and said 'Count them.' Y: 'Three.'

So still *counting is certainly not the means of knowing how many there are in the 'two groups'*.

3;1. Sitting with two others at table S reports Y said 'Three people,' the first spontaneous use of 'three'. Looking with M and me at a picture of a monkey with a big tail Y said, 'That's a monkey and that's a monkey' (pointing to the tail). I said 'No, that's his tail.' Y: 'Oh I thought there were two monkeys, there's one monkey.'

3;2½. I put up two fingers and asked 'How many fingers?' Y counted 'One, two.' And so with three. When asked again 'How many then?' she again counts—instead of just repeating the two or three.¹ (This suggests that *counting is a new mode of approach instead of direct apprehension*.) When shown five fingers and asked 'How many?' she says 'One, two, three,' and then gets erratic, and gives sometimes two counts to one thing and so reaches seven or eight.

3;3. I put up two fingers and asked: 'How many?' Y: 'Two.'

¹ Noted also of Stern's H. at 3;7. Op. cit., p. 283.

I put up three fingers and asked: 'How many?' Y counts 'One, two, three.' 'How many then?' 'One, two, three.'

I put up two fingers. 'How many? Don't count.' Y: 'Two.'
 " " three " " " " Y: 'Three.'
 " " two " " " " Y: 'Three,'
 then 'Four.'

(Was she getting tired of it or did the effort to get 'three' upset her grasp?)

3; 5½. Not tested since last note, and no teaching so far as I know.

I put up two fingers, and asked 'How many?' Y: 'Two.'
 " " three " " " " Y counted 'One
 two, three.'

I repeated 'How many then?' Y: 'One, two, three.' She did not seem to be trying seriously. So I waited and talked to her. M said 'She can do it.' I tried again and

I put up two fingers. Y said 'Two.'
 " " three " " " 'Three.'
 " " three " " " 'Three.'
 " " two " " " 'Two,' and so on.

'Three' is apparently grasped now, as a group, without counting.

Next day. I put up three fingers. Y said 'Three.'

" " two " " " 'Don't know—two'
 (with hardly a pause).

" " four " " " 'Three.' I said 'No.'

Y counted 'One, two, three, four.' 'How many then?' Y counted 'One, two, three, four.' 'How many?' Y said 'Four.' Y did two and three again correctly. Then again I put up four fingers. Y counted 'One, two, nine.' So, *though a gap of three can be numbered at sight, four cannot be got right even by counting.*

3; 9. I put up three fingers. 'How many?' 'Three.'

" " four " Y counted 'One, two, three, four.'
 Then F 'How many?' Y again counted.

At another time when I put up three fingers and said 'How many?' she said 'Two and one.'

3; 11. No instruction given by me since last test (or by others I think). I put up two fingers. Y said 'Two.'

" " three " " " 'Three.'

" " three " " " 'Three.'

" " two " " " 'Two.'

" " four " " " 'Four.'

" " three " " " 'Three.'

" " five " " " 'Five.'

" " four " " " 'Three.'

I asked again 'How many?' Y counted 'One, two, three, four.'

I again put up five. Y counted 'One, two, three, four, five.' 'How many then?' 'One, two, three, four, five.' Counting persisting.

It will be seen that Y at about 3; 6 was about the same in the

tests as B was about 3 ; 3, though she had not then used 'four' spontaneously as B had done. She had not passed through a period of intense interest in counting things as B did at 3 ; 3 and generally her interest in numbers seemed less at this period, but (as we shall see) periods of keen interest came later, about 4 ; 7 and 6 ; 0.

B's development after 3 ; 6. We may now resume the notes on B. We left him at 3 ; 3 when the passion for counting things was at its highest and when 'three' and occasionally 'four' were used spontaneously. From then rapid development must have taken place, for at 3 ; 7 I find I was beginning to teach him to add.

B, 3 ; 7. I asked, 'If you had two grapes (drawing them), and I gave you one more, how many would you have?' B answered 'Three' at once. I drew the third grape and asked, 'If you had three grapes and I gave you one, how many, &c.' B answered 'Four' after a pause. I drew the fourth and asked, 'If you had four grapes and I gave you one?' B responded by counting the four and then said 'Five.'

4 ; 7. Very interested in numbers now: e.g. adds spontaneously 'two and two', 'three and three', 'four and four', &c. Has had two lessons on two-times table up to six; but he did this sort of thing before, after very little encouragement. By 5 ; 0 B was clearly ripe for more formal number work and I began to teach him addition (first by means of rows of dots) in which he made rapid progress.

Y's development after 4 ; 0. A few notes of Y from 4 ; 0 onwards show her at a comparable stage to B at about 3 ; 6. (Her I.Q. as shown by Binet tests both now and later was about the same.)

Y, 4 ; 0. Uses 'twice' correctly. 4 ; 1½. Uses 'four' with great facility now; e.g. Y was talking of the maids we had had and said, 'We've had four maids, N, M, R and L. That's four.'

4 ; 5. Y was looking at picture. I said 'How many girls there?' Y said 'Five' (right). 'How many boys there?' 'One' (right). 'How many people all together?' Y said 'Six.' Y then added spontaneously: 'If there was two boys there would be seven people.' Neither M nor I have given her any coaching in adding—though she has heard countings.

6 ; 1½. Shows great interest in number work recently. M told me she made up her own four-times table the other day as they walked along.

Summary of steps in the learning of numbers. We may now summarize the steps in B's progress with numbers, quoting comparative notes on Y and some on X and A, and adding confirmatory notes by some other observers. Even if these children were ahead of average children in their dates of developing certain performances, the order of development probably holds good more or less for all.

By 1 ; 4 B probably distinguished between two and three objects that he was interested in.

1; 8. Counting began but only as a series of sounds: so Major's R at 1; 7.

1; 9. 'Two' or 'two-three' means 'another' or 'more of the same kind of thing'. So Y at 1; 8. Also Stern's Hilde at 2; 4 used 'two' for several.¹

1; 10. 'Two' first used spontaneously as meaning the group of two. So Y at 1; 11. Soon, however, the learning of counting—one, two, three, causes confusion so that two horses may be called 'Four, five, two gee-gee.' So with Stern's Eva at 2; 1 and Hilde at 3; 2.²

2; 4. The spontaneous and correct use of two as meaning a pair is well established in B and Y and X. But the use of 'two' in answer to the question 'How many?' is still uncertain. The spontaneous use also came first in A at 2; 6. I have suggested that the interest of the moment raises the mental capacity to a higher level for the moment. It is, I think, a similar phenomenon to what Stern noted as the learning of 'two' first only in connexion with certain objects, the lack of interest hindering the correct use with other objects. Major thought that his boy learned them at first only in connexion with apples.³

Only about 2; 9 is the spontaneous use of 'three' well established—that is, some five or six months after the similar use of two. An even greater interval was noted in Y ('three' first used at 3; 1½) and Stern observed a similar thing.⁴ Mlle Descoeudre's results also confirm very markedly the finding of the long interval between the correct use of 'two' and the similar use of 'three'. Thus she found that the apprehension of a group of two and giving the number without counting, was attained about 3; 0 (by 74% of the children), while a similar percentage managed 'three' only at the age of 4; ½. 'Four' was only mastered by the six-year-olds.⁵

The early phase of counting is merely repeating meaningless sounds; then comes the realization that the sounds have something to do with a series of objects (B at 2; 1). Then comes another phase in which the child attaches each number to only one object in a series when counting them. This was noted in B at 2; 3, when three objects were counted, but not with four objects; it only seemed well established at 2; 8 or 2; 9. The last stage comes about 2; 9, when it was at last realized that the last number counted also gave the total number of the objects, a stage not reached by Y till about 3; 6, and by Stern's H only after 3; 7.⁶

Then comes at 2; 10 (B) the use of 'four' as indicating the group—very quickly after the use of 'three' considering the long

¹ *Die Kindersprache* (4th ed.), p. 281.

³ *Op. cit.*, p. 171.

⁵ *Op. cit.*, p. 266.

² *Op. cit.*, p. 282.

⁴ *Op. cit.*, p. 282.

⁶ *Op. cit.*, p. 283.

interval between the use of 'two' and 'three'. With Y the interval between the use of 'four' (about 3; 10) and that of 'three' (about 3; 2) was longer than with B—as was the interval between 'two' and 'three'. Nor did she have a period of intense interest in numbers until about 4; 7, while B had one about 3; 3.

THE APPREHENSION OF SHAPE

As early as 1; 0 it seemed that B recognized a small picture of a dog and at 1; 2 picked out pictures of men and women and called them 'dadda'. My own impressions quite agree with Miss Shinn's that in learning at this early stage to recognize and classify things, shape plays a much greater part than colour.¹ As Major points out, the word 'ball' may be applied to apples, pears, grapes, and anything spherical, and though touch sensations and 'what the object will do' may conceivably have something to do with the transference, the ready recognition of pictures in black and white shows the significance of mere form.

So much for the apprehension of the shape of common everyday objects. I was, however, surprised to find at how early an age some children can distinguish, recognize (by sight alone), and learn to name abstract shapes such as the circle, square, triangle, &c. These things were done with remarkable facility by the two of my children whom I tested and taught specially with geometrical shapes. For B from about the age of 1; 9 I was constantly drawing animals, houses, &c., and he loved to watch; then I began to draw for him circles, squares, &c. Then come notes of observations and tests on the learning of the names of these shapes and a series of experiments, the latter planned especially to test the relative efficiency of touch and sight in learning to recognize shapes.

Some authors, notably Madame Montessori, have stressed the importance of the sense of touch as a medium for learning during the 3rd, 4th, and 5th years. Thus Madame Montessori provided special exercises for the 'stereognostic sense', including the touching and tracing of the form of cubes and other shapes by blindfolded children.² Tracing with the finger the shapes of the letters was also an important factor in her method of teaching to read and write.

This is not the place to discuss the worth of the methods Montessori has made famous. But the given observations and experiments below afford evidence as to how limited is the value of the sense of touch as a medium for learning at the age of 2 and 3, and show the superiority of the independent power of sight as a medium for the children B and Y, as contrasted with the independent power of touch.

¹ Op. cit., sections on Colour and Form.

² See *The Montessori Method*, p. 189 (London, 1912).

B, 1; 11 (d. 709). I tried to teach him the names of the circle, square and triangle by drawing them for him and telling him their names when drawn. After two drawings of each, the triangle and the circle (called O) were correctly named, the square however being called a triangle. d. 713. B learnt to pick out a triangle after three or more drawings, but not the square or circle. He named the triangle correctly several times. 1; 11½ (d. 715). Now knows the triangle and square but sometimes called the circle a square. Oblong now added to shapes used. All of 8 tests (of picking out) with the four figures done correctly.

d. 721. Perceived that a piece of his bread was cut in the form of a triangle. Held it up in excitement and said 'I-angle.' Thus the apprehension of the shape is not 'tied' to the object through which it was learned, as was the case with Major's R even at 2; 8.¹

d. 726. I made him geometrical insets and a form-board like Montessori's. A triangle, square, circle and oblong. He put them in with one error. d. 727. Named square, triangle, circle (which he calls 'O') and oblong all correctly when drawn on paper. (It is notable that in placing insets on the same day he made several mistakes, though he *named* them all correctly.)

This happens to be a period at which, as noted, 'B always wants to know the names of things. This early apprehension of geometrical forms and learning of their names was also coincident with great inability to draw the forms or even to trace their shapes; thus, at

2; 0 (d. 733). I cut out a large circle in cardboard and tried (in Montessori's way) to help him to learn to draw the circle by running his pencil round the hole. This he seemed quite unable to do, often cutting across the middle or pushing his hand right through. He makes quite a fair attempt at drawing a circle without such aid, so he finds freehand drawing just as easy as guided movement.

d. 736. After he had named a square and oblong correctly, I drew half a square. He said, 'Oblong.' When I completed it, he correctly named it 'square'. I introduced him to the ellipse to-day and after I had named four drawings of an ellipse, I tested him with a circle, which he named correctly and then correctly named in order [ell]ipse, circle and ellipse.

d. 740. Practice in drawing a square, with my guidance. I drew a pentagon, and he guessed (after a long pause) that it was a triangle, and then a square.

d. 746. Named pentagon ('pentge') correctly, first time, after being shown yesterday six times; now recognized it even before the fifth side was drawn.

d. 751. Now recognizes a pentagon as soon as a third side is drawn and a triangle when two sides are drawn. So far B has never been taught to draw a pentagon which he recognizes so readily, though occasionally he

¹ *First Steps in Mental Growth*, p. 180.

has tried to draw a triangle, circle and square. Even at this stage, indeed, tracing over a provided outline is very inaccurate.

Taken as a whole, these observations indicate strongly that these shapes can be learned rapidly through the sense of sight, without any practice in tracing the outlines with the fingers and before even handling the insets. Also even after B had learned very thoroughly the shapes through sight, the perception of the shapes through touch alone is very inaccurate, as is shown by the next test.

Tests of perception of shape by touch. At 2 ; 0½ a test was given B when carefully blindfolded. The objects mentioned below were put into his hands and he named them as indicated showing 11 errors out of 17 attempts at the geometrical figures.

Object.	Name given	Object	Name given
Ball	Ball	Cardboard triangle	Pentig, triangle
Slipper	'Toe-toes'	Cardboard pentagon	Oblong, square, triangle, pentig
Cardboard triangle	Triangle	Cardboard ellipse	Oblong, triangle
Cardboard circle	Circle	Cardboard ellipse	Circle, ellipse
Cardboard square	(i) Oblong, (ii) pentig	Cardboard pentagon	Circle, ellipse
Cardboard oblong	Oblong		

A final test at 2 ; 2 and again at 2 ; 2½, after these geometrical figures had been neglected for five weeks, proved that he still recognized by sight, and named at once, the circle, oblong, triangle, square and pentagon.

Y's learning of geometrical shapes. At about the same age (2 ; 0½) Y was given a similar formboard. No actual experiments were tried with her, but I made careful notes of her progress.

After two attempts at the form-board (with the shapes not placed opposite their right holes) and her errors being shown to her, she 'did' the thing correctly on the third attempt in 1 minute and on the fifth in 20 seconds. On the fourth, fifth and seventh, she had to correct herself. The same day four minutes were given to teaching her the names ; and two days later each name was told her twice, but in placing the shapes she had to correct herself ; twelve days later she placed the shapes correctly and she scored as follows in naming and picking out by name. Triangle 5 out of 5. Circle 6 out of 6. Square 3 out of 10.

It will be seen that the form-board placing was quickly learned : I think Y's impetuosity led to some of her first errors (as it did to errors in the Maze Tests at 8 ; 0 and 10 ; 0, in which she scored low compared with her score in other general intelligence tests). I was surprised that a rest of twelve days showed no deterioration, perhaps some improvement.

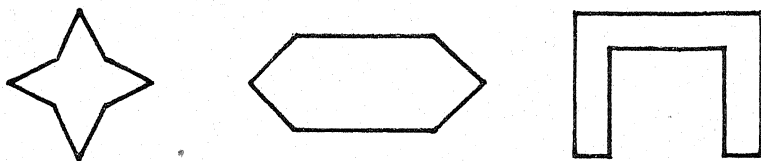
No other instruction was given and no tests were given for a

month: then she was tested at 2; 1½. The square was first mis-named and then correctly given, and the triangle was named correctly. The next note is at 2; 5.

The shapes have been played with only once (or perhaps twice) since the last test, but no instruction given. To-day she knew the names at first attempt, and again in the second and third tests after rearrangement. I get the impression that mere maturation is very important at this stage.

Experiments on learning through touch versus learning through sight. With a view to testing more exactly the relative efficiency of touch and sight in the apprehension of shapes and the learning of their names, I devised the following experiments for B at 2; 3 and for Y at 2; 10.

Preliminary Experiments. Three pieces of cardboard were made into the following shapes.



In the first experiment, a *Touch* test, B was blindfolded and given the first shape. It was held in his left hand, while he traced the outline of the figure with the right forefinger, my hand guiding his.¹ Meanwhile, I told him the name given to the figure, viz. 'Rats', which he repeated after me. This was done for one minute. Then the second figure was taken and B was taught similarly for one minute, the name being 'Diamond'. Another minute was devoted to the third figure, called 'Gate'. At the end of these three periods of instruction, a test was given to see if the names were learned, each figure being put in turn into B's hands and the name asked for. The figures were then put out of sight. B's eyes were now unbandaged and after a rest the figures were brought out again, one at a time, for the *Sight Test*. I carefully avoided any hint that they were the same, and different names were now given to the figures, but of course the child may have guessed they were the same. B was shown Figure 1, but not allowed to touch it and he was now told the name was 'Star'. This was exposed for one minute and then each of the other figures given its turn, being now named 'Hexagon' and 'Stile' respectively.

Now each figure was presented in turn and the name asked for. After the first three days only one test of touch or sight was given on any one day. I give in Table A below the results of this preliminary experiment. But I regard it as unsatisfactory for two reasons.

¹ This was done by holding near the wrist, leaving the finger some freedom; guidance became less necessary as the experiment proceeded. Possibly completely free exploring might have proved more effective, but some guidance was necessary to ensure that contact was preserved.

(i) Some of the names given the shapes, though they were certainly not known as the names of the shapes or anything like them, may have been already familiar by sound and so more easily said and learned. Probably 'Gate' (a 'touch' name) was most helped thus. On the other hand, 'Hexagon' was too difficult. Note, however, that both these points favoured the Touch Tests.

(ii) I was not contemplating a long series of tests at first and in the fifth sight test I allowed B to touch the Hexagon and the Stile during the testing, to see the effect of this. This no doubt had the effect of emphasizing the link between the *touch* name (gate) and the *sight* of Figure 3. But B first gave the touch name, before touching it, during the instruction.

Table A

Touch tests . .	1	2	3	4	5	6	7	8	9	10	2 weeks interval	Final test
I Rats . . .	-									S		S
II Diamond . .	-	Gate								S		S
III Gate . . .	-		I	I	I	I	I	-	I	I		I
Sight tests . . .	1	2	3	4	5	6	7	8	9	10	2 weeks interval	Final test
I Star . . .						I Tile (a)	Ex		I	I		I
						Gake	Tile					
							I					
II Diamond . .						Tile		I	I	I		I
						Tile						
III Stile . . .		I(b)			T (i) Don't		T I ?	I		T		T
					know			T				
					(ii) Gike							

Right name is indicated by i. Where a blank is left B either said 'Don't know' or made a sound unlike any of the names used for touch or sight.

S means the 'sight' name was given in the Touch Test.

Y means the 'touch' name was given in the Sight Test.

(a) not certain whether 'tile' or 'tei'.

(b) not certain whether 'tile' or 'tua'.

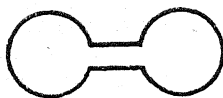
The result of this preliminary experiment on the whole favours Sight; the names of two out of the three seen shapes are learned and the other is named at least once correctly, and, more striking still, two of the touch shapes are given the sight name—against one seen shape which is given the touch name. The most notable fact, however, revealed by the experiment, is the possibility of the *transference of the name learned through sight to the objects perceived through touch, and vice versa*. Whether it dawned upon B that objects touched were the same as those seen, I had no other means of judging than the evidence of the transferred names. The recognition seems to be implied in this transference, yet it is strange that B did not exclaim 'That's the same that I saw' or something like it. Possibly we have here an early example of the distinction

between having an experience of resemblance without cognizing the experience as such.¹

Experiment 2. In order to avoid the weak point in the method of the first experiment, namely, the using of names some of which might have been familiar sounds. I planned another experiment, with new shapes. This was done with B when he was 2; 4. The shapes were as follows with their corresponding names according to whether they were seen or touched.

Sight Name

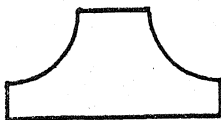
Deb



Touch Name

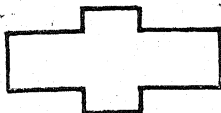
Mem

Mat



Pit

Bup



Gok

The procedure was as before, except that I slightly lengthened the time of learning through touch, giving each lesson ten seconds more than the minute given to sight. This was done to make sure that as much time was spent in actively learning through touch, although there was constant danger of time being wasted in the sight test, through B's eyes wandering. Table B gives the results of this second experiment.

Table B

Touch Tests Date . . .	June 12	16	18	21	23	25	Test only 28	Test July 2
Mem . . .	Gok	Yok	Gok	Pit	Gok		Deb(S)	S
Pit . . .	Gok	I	I	Gok Pit } $\frac{1}{2}$	I		Mat(S)	S
Gok . . .	I	I	Mem	I	Pit		Gok Bup }	S
Sight tests Date . . .	June 12	13	19	20	23	24	28	July 28
Deb . . .	Map	$\frac{1}{2}$ (Det)	$\frac{1}{2}$	I	I		I	'Ap
Mat . . .	Map	I	I	I	I		I	Lip
Bup . . .	Map	I	I	I	I		I	I

¹ In the sense of Spearman's First Law of Cognition.

This second, more exact, experiment, in which extreme care was taken to prevent B from ever seeing the shapes during or just before the touch tests, or touching them just before the sight tests, reveals more emphatically the superiority of sight. Each of the sight names is learnt by the fourth lesson, two of them being learned after the second lesson, and at the test at the end of the lessons on June 28 all the sight names were known, and *sight* names were given to two of the shapes even when only perceived through *touch*. Still more striking, at a later test, July 2, all the shapes touched are given the sight names. Even a month later when I gave an extra sight test (July 28), one of the sight names is remembered and a good attempt made at a second ('Ap for Map).

There was evidence once or twice in the course of these experiments that the names were remembered as names occurring in the touch series, so that we must allow for mere guess-work scoring a few marks, as it does even in the touch series. The scores in the sight series, however, are far too constant after the second lesson for us to attribute them to chance. I should add that throughout all these experiments I constantly varied the order in which the shapes were given at a given sitting; and in this second series, intervals were several times left between the days on which a sitting was given and only twice were touch and sight done on the same day.

Experiment on Y. A third series of experiments were done with Y, when she was 2; 10. The same shapes and names were used as with B in Experiment 2. The results are given in Table C.

Table C

Touch lessons Dates . . .	1 June 27	2 30	3 July 6	4 19	5 21	6 25	7 Aug. 3	8 6	Interval of 3 weeks	Test Sept. 1
Deb . . .	-	Mat	Bup	Gok	-	Pip	Pip	Pip		-
Mat . . .	-	Bup	Bup	Gok	-	S	S	I		-
Bup . . .	-	I	-	S	-	S	S	S		-
Sight lessons Dates . . .	1 June 29	2 July 5	3 8	4 18	5 20	6 22	7 Aug. 2	8 4		Sept. 1
Mem . . .	I	Pip	Pip	Pip	Pip	Pip	Pip	Pip		-
Pip . . .	I	Gok	I	I	I	I	I	I		-
Gok . . .	I	I	I	I	I	I	I	I		-

In the first two sittings (touch and sight) the test was given $\frac{1}{4}$ minute after each shape had had its $\frac{1}{4}$ -minute learning period. After these first two sittings the tests were given only after all three shapes had had their learning periods and in a different order from that in which they had been 'learned.'

The only differences introduced into the experiment were: (i) The learning periods were reduced to half a minute and later to 20 seconds.

The touch learning period was not made longer than that of sight, as I found that, with Y, there was a much greater disposition to inattention during the sight-learning periods.

(ii) In this series, touch and sight lessons were never both given on the same day; longer intervals were purposely left to lessen the likelihood of the child guessing that the shapes were the same in the test and touch experiments.

Frequently, in the touch-learning and tests, Y said 'Can I see?' and, less frequently, in the sight-learning, 'Can I touch?'

With Y at the later age of 2; 10 and 2; 11 the superiority of the sight scores is again marked. The scores throughout are less than B's, but the learning periods are less than half his.

The most striking result is that, in Test 6 (June 25), in spite of the names having just been repeated over and over again while touching shapes 2 and 3, nevertheless when the test was given a minute or so later the *sight* names were given then, although these sight names had not been learned since three days previously (June 22).

Summing up these experiments on sight and touch, we may say that for the two children B and Y at the ages of 2; 4 and 2; 10, shapes are learned and recognized through sight alone much more readily than through touch alone: and the final transferences of the sight name to the object even when only touched suggests that at this stage sight is more efficient, as indeed we found it to be in the first few months of life (see Chap. V, p. 69).

COLOUR DISCRIMINATION AND COLOUR PREFERENCES

Some experiments with colours. There has been considerable uncertainty as to whether infants discriminate colours in the first few months. Stern and Miss Shinn agree at least that colour has little or nothing to do with the earliest recognitions of pictures of objects—that shape is adequate and predominant. The apparent attraction of coloured objects (e.g. yellow daffodils for Miss Shinn's niece at 0; 4½) is uncertain testimony, for the object itself may be attractive apart from colour. Careful experiment is therefore essential to settle the question of early colour perception. I carried out an elaborate series of tests on one of my boys beginning at the age of only 3 months, to find out how early colours were discriminated. Earlier investigations had been confined largely to the period of about 6 to 12 months, the method used being to note which of several coloured objects the child tried to grasp most frequently.¹ Baldwin's method was defective; but the others agree

¹ J. M. Baldwin, *Mental Development in the Child and the Race*, Chap. III. Shinn, *Notes, &c.*, II, *The Development of the Senses in the First Three Years of Childhood*, p. 148. W. McDougall, 'An Investigation of the Colour

that about 6 months or later certain colours can be distinguished and that red and yellow are preferred to greys.

As I wished to test the colour sense before the child could handle things I had to devise a new method. This consisted in measuring with a stop-watch the relative lengths of times which the infant gazed at one or other of two skeins of coloured wool, held so that he could see them against a grey background.¹ Holmgren wools (for testing colour-blindness) were used. The colours used were red, yellow, green, blue, violet, pink and brown, as well as black and white. Each of the colours was paired with each of the others on different days. The wools were exposed only two minutes for one sitting. The results were surprising to me. It was clear that there were already marked preferences at 0;3, judging by the length of time the respective colours were looked at. Thus yellow was looked at about 80% of the total number of seconds that the boy was looking at either of the two colours (yellow and its partner) held before him; White scored 73%, Pink 72%, Red 45%, Brown 38%, Black 36%. Green and Blue scored only 28% each and Violet less than 10%; there seemed indeed to be an actual aversion from Violet. Allowing for the attraction of mere brightness, which I shall refer to directly, the order of preference was almost in the order of colours in the spectrum.

At 0;7 the same boy was tested by the grasping method, comparing the number of times he seized the various colours when two at a time were put within his reach. Due care was taken that each colour should be placed on the right and on the left an equal number of times. At 0;7 the boy still liked yellow best and then red and pink. White is now not preferred to grey and even violet.

I should add that three different tests for brightness which I applied to the wools showed that while pink and yellow were the brightest, the red, green, blue and violet were practically equal to one another in brightness. These results, and the observations of Miss Shinn given below, suggest that there may be something very fundamental in the appeal of the colours of the warm end of the spectrum to some infants at least. The influence of associations can hardly have crept in by three months, and if they had it is impossible to see why yellow and red should be so much liked

Sense of Two Infants', *Brit. Jour. of Psych.*, II, 338. C. S. Myers, 'Some Observations on the Development of Colour Sense', *Brit. Jour. of Psych.*, II, 353.

¹ I have described the method of these experiments and the results in detail in an article on 'The Colour Perception and Colour Preferences of an Infant during its Fourth and Eighth Months', *Brit. Jour. of Psych.*, VI, 363. I have given there (p. 364) my criticisms of Baldwin's methods.

or violet disliked. Miss Shinn summing up her impressions and tests of her niece's preferences at 1;0 also reveals a preference for the warm end of the spectrum, and for brightness. She concluded that the order was—first 'yellow, then orange, red and pink, while blue and violet were scarcely noticed, green still less'—though bright colours were always preferred to dull.¹ Inquiries at later ages suggest that red is the most popular colour with children of the age of about 4 to about 6.²

It may be recalled that Féré found the colours of the warm end of the spectrum much more stimulating physiologically than those at the other end.³ As to the effects of colour on infants and their preferences, there are no doubt great individual differences. Major's child R, for example, seems even in the second year to have been very indifferent to colours, or at least any interest was swamped by the greater delight in handling any object, coloured or not.⁴

The naming of colours. When B was 1;11 I began to teach him the names of the main colours more systematically, though he had occasionally heard and used some of them.

Test in picking out colours. d. 702. I selected black, red and yellow (Holmgren) wools: showed him each in turn and named it. This was repeated three times. Then he was asked to pick out a colour named. The scores were: Red, 5 out of 5; Yellow, 3 out of 3; Black, 3 out of 5—yellow being chosen twice instead of black.

Naming test. I then asked him the names of the wools and gave him two tests with each colour. Scores: Red, 0 out of 2; Yellow, 2 out of 2; Black, 1 out of 2. Here B picked up the wools, saying 'Baby d'aw' (drawer) and ran and put them away, apparently having had enough for the day!

Picking and naming test. d. 706. Green and blue were added to the red, yellow and black. All were named twice for him. Each was picked correctly when asked for. Then I asked for names. Scores in 4 tests with each colour: Red, 3; Yellow, 3; Black, 0; Blue, 4; Green, 0. He appeared bored and mischievous.

Similar training and tests were continued on six further days, grey and violet being added.

By d. 715 the total scores for *picking out* were as follows:

Black, $\frac{8}{10}$; Red, $\frac{13}{14}$; Yellow, $\frac{12}{13}$; Blue, $\frac{9}{10}$; Green, $\frac{7}{10}$;
Violet, $\frac{9}{10}$; Grey, $\frac{7}{10}$; White, $\frac{9}{9}$

¹ *Notes on the Development of a Child*, I, p. 29.

² See the author's *Experimental Psychology of Beauty*, 2nd ed., p. 16.

³ *Ibid.*, p. 13.

⁴ *First Steps in Mental Growth*, p. 160.

The tests so far indicated that picking out a colour named was easier than naming a colour shown. This was also found by Miss Shinn. Yet spontaneous naming of colours began at this same period. Thus:

d. 707. Does not seem to like naming colours, but thoroughly enjoys picking them out. Looking at red in a picture he said 'Be' (red) and then held up the edge of his pinafore which is red. (So the name of the colour is not 'tied' to the objects by which he learned it.)

d. 708. Of his own accord got out the wools and played with them, picking and naming spontaneously especially the red and yellow.

It is clear at least that before 2;0 the capacities required for the naming of colours had matured. The learning and testing of numbers preoccupied me from now on and left little time or energy for continuing the colour tests. But there is confirmation that by about 2;0 such naming of colours can be achieved. Thus: a systematic experiment was made by Major on his child R at the age of about 2;4 when he learned to name accurately the principal colours; and R was not much interested in colours.¹ Miss Shinn's attempts to teach her niece at 1;5 showed first success with red, yellow and blue, followed by a period of confusion: she was not yet ripe for it. But at 1;7 the learning of these three colour names was much more successful.² My colleague, Mr. J. F. Waterhouse, reports on his boy:

J. C. G. was using colour adjectives 'red' and 'blue' in combination ('red shoes', 'blue hat') before 2;0, and at 2;3 could identify without error seven colours in reference to any objects indicated to him, whether or not he knew the appropriate noun: 'red', 'blue', 'green', 'laller' (= 'yellow'), 'orange', 'black', 'fwight' (= 'white',—he has noticed and exaggerates the distinction between 'w' and 'wh'). He will also frequently distinguish between 'red' and 'pink'. He often volunteers these colour-descriptions, but does not seem to understand the merely verbal question, 'What colour is so-and-so?' The word 'colour' itself does not seem to have any meaning for him yet.

THE UNDERSTANDING OF PICTURES

The recognition of pictured objects seems to occur at a surprisingly early age. B would say 'Bow-wow' at the sight of pictures of dogs about the age of a year, though they might be tiny sketches only about an inch long; and even at 0;8 B showed spontaneous interest in a large copy of Greuze's picture of a boy's head. At 1;0 he would spend a long time looking at pictures

¹ Op. cit., p. 155.

² *Notes on the Development of a Child*, I, pp. 32-4.

in a linen book we gave him. Miss Shinn's niece showed recognition of pictures of a cat at 0; 9½ and at 1; 1 picked out her father in a group photograph of nine persons, the faces being only about a quarter of an inch in diameter.¹ Major's J seemed to recognize the picture of a human face at 1; 0.² No doubt the recognition is greatly helped by an adult naming the pictured object; in fact, we cannot be quite certain this is not the original cause of the child's apparent 'recognition', subsequent correct naming by the child of other pictures of the same thing being due to recognition of the resemblance between the two pictures. I cannot think this is the real origin, however, because such very different pictures of, for example, a dog are recognized as such at these early stages; so that the recognition that pictures (b), (c), (d) were pictures of the same animal as that in picture (a) would be as difficult an accomplishment as recognition that (a) meant a dog. On the other hand, in the earliest stages there is apparently only a very uncertain and perhaps suggestible attitude. Thus once or twice at 1; 1½ B barked at pictures in which there was no dog. (Compare the transfer to all pictures of men of the name 'Grandpa', learned first for his grandfather's portrait, see p. 394.) The fact that a picture was understood was more clearly shown by B at 1; 10 by his imitating people or animals in pictures, for example, children running or birds hopping.

Several observers have noticed their children looking at pictures upside down. I noted of B at 1; 4½ that he recognized pictures of birds upside down, as shown by his saying 'Dickie' to them: and so with pictures of other objects at 1; 9. At 1; 9½, however, he was several times noticed turning a picture (e.g. of a steamer) the right way up before gazing at it.

There seems to be a good deal of difference between children in this respect. Mrs. Moore says her child, though very interested in pictures from 1; 4, seemed indifferent until about 1; 10 as to whether they were upside down or not, and pointed out details when they were upside down.³ Sully even refers to a girl of 3; 6 who was equally indifferent.⁴ Major's child J also made no effort to turn pictures right side up till she was 2; 5. On the other hand, Major's R, from the time when first observed looking at pictures, namely 1; 4½, 'insisted on having them right side up' and would constantly change pictures or photographs in the room when his father deliberately left them upside down.⁵ Major adds that he was quite unable to explain this difference between R and J.

¹ Op. cit., pp. 72 and 74.

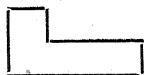
² Op. cit., p. 251.

³ *The Mental Development of a Child*, p. 60.

⁴ *Studies in Childhood*, p. 310.

⁵ Op. cit., p. 255.

By about 2;0 it needed little resemblance of a picture or of a drawing to an object, to suggest that object to B. Thus at 2;1½ he looked at a linoleum pattern and said 'Puff-puff.' I said 'Where?' and he pointed to a part of the pattern like this



(I had often recently drawn him simple sketches of an

engine.) It will be recalled that about this age B would recognize and name even a pentagon when I had drawn only three sides. At about 2;8 one of his greatest delights was the mere recognition and naming of things pictured in a huge illustrated catalogue; he would go over a page repeatedly saying 'Dere hat,' 'Dere hat,' 'Dere coat,' &c.

Other notes on B's observations of pictures are as follows:

1;7½. The men's heads seem to interest him most in a big picture magazine. He often points to them (even bearded ones) and says 'Da-da.' Obviously most pictures are too novel for him. He sometimes points to heads of women and says 'Da-da.' (N.B.—Da-da was sometimes used as an expression of delight as well as for father. See the chapter on Language, p. 379.

The realistic attitude towards pictures. Some conversations with Y about pictures when she was about 4;0 at first greatly surprised me: I quote the records.

Y, 3;11. She was looking at a picture book and asked 'Why do they have tea?' Father: 'Because they are thirsty and hungry.' Y: 'Why do they have it such a long time?' F: 'Oh, that's only a picture, they're not real people.' Y: 'But she can stand up, she can talk.' F: 'How do you know? You haven't heard her?' Y: 'But the little boys can hear her.' F: 'How do you know?' Y: 'Because they're holding their heads up.'

This conversation was noted and memorized by me at the time, and then recorded immediately afterwards.

Y, 4;1, looking at a picture of a 'wolf', called it a dog. F: 'That's a wolf, not a dog.' Y: 'I like it.' (She kissed it.) 'Aren't I funny. I like wolfs. Does it bite?' F: 'Yes.' Y: 'Not in pictures, does it?' F: 'No.'

Again at 5;0 I found her grieving over the picture of a freak cat with a long spring neck. She was saying 'Poor pussy.' When I laughed she said angrily, 'Don't laugh at it.' Similar sympathy was shown with animals in pictures as late as 5;10. Vilhelm Rasmussen says that his girl R at about 4;10 asked why they could not see how people in pictures walked with their legs. 'Evidently',

he adds, 'she considered pictures as something living, that must move.'¹

But the similar behaviour of Y occurring as late as 5;0 (in a child whose mental age would be then over 7;0) makes it incredible that she was unable to distinguish the pictures from reality, as may be thought in some of the earlier occurrences of such attitudes noted by other observers, for example, Miss Shinn's niece who at 2;0 tried to lift a branch of a tree that was depicted as lying on a little lamb, and at 2;11 put her hand between a little chamois (in a picture) and an eagle that was attacking it, asking anxiously if the mother chamois would drive the eagle away from the little one. Miss Shinn surmises that the child may have momentarily forgotten that she could not lift the branch or that it was merely a demonstration of feeling.²

As early as 1;7 Major's child R, though he recognized pictures of cats and called them 'tats', showed no fear of them, though 'very much afraid of real cats': he enjoyed holding and looking at the pictures.³ Nevertheless, the conversation of Y about the picture of people having tea, and her keen sympathy with the screw-necked cat, demand some explanation. I think they are examples of that extreme form of the realistic attitude shown by children when in the cinema they cheer the arrival of the hero at a critical time for the heroine, or as Major himself suggests, of the attitude of adults to a vivid piece of acting, or even the profound emotional response of some adults to a very sad picture. But in the examples of Y given above it goes a little further than that: for the attitude apparently survived even some critical discussion with me, and my laughter at her sympathy with the cat. It is connected no doubt with a child's exceptional capacity for vivid imagination of such things as are depicted. At the same time I feel there is some mystery left about this realistic attitude to pictures even when we approach it from this point of view. It may be peculiar to a few children. I do not remember it appearing in conversations about pictures with any of my other children.

¹ Ruth: *Tagebuch über die Entwicklung eines Mädchens*, 1934, p. 82.

² Notes, &c., I, p. 104.

³ Op. cit., p. 251.

APPENDIX I

Stages of Development

In a book of this type it is impossible to give any general summary of results or conclusions. The very essence of the book has been the provision of numerous concrete facts illustrating many varied points.

As, however, it has been necessary for our purpose to follow separately the development of various individual impulses, traits or capacities, it may be useful, in a brief appendix, to arrange some of our observations in a different way, namely, to indicate the main new developments at certain successive stages, considering all aspects of the child at 3 months, 6 months, 9 months, 1 year, 1½ years, and so on. Accordingly I give here a description of these stages for the boy B, on whom most records were made.

The reader will thus see certain items of the earlier chapters grouped with other and different events occurring at the same period: or if he reads this Appendix after the chapter on The New-born Infant, he will get a general point of view first, and be able to turn back for the detailed study of particular topics. The reader will also be able to compare the records of various stages with attempts to describe the 'average child' at these periods, such as those given by Gesell;¹ but it should be borne in mind that I give mainly the *new* developments taking place at a given period, rather than a summary of all advances since the previous period. (It should be mentioned that B's I.Q. was about 140-150.)

In this summary we shall take the ages 0;3, 0;6, 0;9, 1;0, 1;6, 2;0, 2;6, and 3;0,² describing as far as possible the main new developments during the month following each of these stages, i.e. 0;3 to 0;4, 0;6 to 0;7, 0;9 to 0;10, and so on. An accomplishment just reached a week or two before the particular month will also be mentioned. After 1;0 the range is further increased. Thus the notes at 1;6 really cover the period 1;5 to 1;7, and so on.

Even in this cross-section treatment it seems preferable to have some broad classification of aspects of development, and we shall use the following:

- (1) General and Social, including those aspects difficult to place under one class.

¹ Best given in his latest book *The First Five Years of Life*, Chaps. 3 and 4.

² Here and throughout this book the age is indicated thus: 1;0 means one year, 1;3 is one year and three months, 0;3 is three months, &c.

- (2) Innate Propensities (or Impulses), Feelings and Emotions.
- (3) Movements and Skill.
- (4) Learning, Remembering, Language and Ideas.

It will be understood that in many cases there must be overlapping, and some activities might well appear under two headings.

B at 0 ; 3—0 ; 4

General and social. Healthy and vigorous, weighs nearly 16 lbs. Most of the twenty-four hours seem occupied by sleeping, feeding and being bathed, &c. Here is a record of a typical day at 0 ; 3 as seen and written by his mother.

d. 93. B woke at 4.30. Slept again until 7.0. After bath and feed got rather cross. I have noticed lately that being sleepy often makes him cross. He frequently cries after being put in pram and then suddenly drops asleep. Took him out about 10.0, when he fell asleep and slept in garden till 12.15. Fed and lay on chair for little while, then got cross again so I put him in cot and rocked him off to sleep. He seems to fight against sleep now. Slept till 3.0. Fed and taken to Mrs. S. Quite good but rather noisy. Crowded with delight when put in pram and taken out again. Lovely over wash, chuckling, stretching, kicking. Asleep by about 6.45. I went into the room later and found him with his eyes open and his hands waving about. He soon went off again. Does he often wake like this, I wonder, when alone and making no sound? Wakened at eleven for me and stayed awake some time; had to be rocked and at last given my finger to suck.

Though still at the stage when life is largely food and sleep, and when some reflexes even are not matured, there is an astonishing interest in human company and the human face, and it is not merely the mother's face. At 0 ; 3 B 'lies happily in the arms of a woman he had not seen before, gazing at her face and talking to her'. He stares at my face and cries when I cease to look at him even without moving away. He smiles at us spontaneously and in response to smiles. When I leave him after talking to him he yells for two or three minutes and then chuckles and smiles when I return. Before 0 ; 4 his reactions to strangers become somewhat different from his reactions to us: he is more solemn, and he stares at them earnestly.

Crying is often inhibited by distracting the attention of the child, for example by playing a chord on the piano or putting a sheet of paper over his head.

His skin is remarkably insensitive; being hit on the thumbs with a rattle hard enough to hurt me seems to please him.

Innate propensities or impulses, feelings and emotions. The constant smiling just referred to and the chuckles and crude laughter, are interrupted so suddenly at times by cries that one concludes that at this age feelings or emotions must be exceedingly fluctuating. There is little evidence of differentiated feelings, though the pain and hunger cries differ, and the loud scream, the jerking of the arms and general body-reactions at various kinds of shock, suggest a type of fear. These follow loud sudden strange noises. There is no imitation yet, except the cooing response to

our talking to him, unless we call smiling and laughing responses to a smile or laugh, imitation.

Movements and skill. Spontaneous jerky movements still dominate the scene at 0;3, but some definite reflexes have already appeared. The finger-reflex, grasping on touch, is now beginning to be accompanied by voluntary slow groping of the hand (prompted by sight of an object). The two often co-operate, though at times the reflex may interfere with the volitional grasp, such interference continuing for over a month (Chap. VIII, p. 107). In grasping, the right hand is more precocious than the left. The walking reflex is disappearing (p. 115), providing a good example of an 'anticipatory phenomenon' (Chap. IV, p. 55), and of nature beginning the preparation of mechanisms long before they are needed. The eye-blink at a touch or at a loud sound is beginning to be linked with the sight-stimulus of an approaching object.

B can hold a silver rattle in his hand and move it slowly to and fro while gazing at it; then he may bring it to his mouth. When an attractive object is offered in front of him, he opens his arms wide and converges his hands on the object. If he fails, he spreads his arms wide again and repeats the movement.

Learning, remembering, language and ideas. The first associations are set up by 0;3, namely, between the anticipation of food, and (a) the position in which he is held, or (b) the sight of the mother's face. There are also clear signs of learning the direction of a sound.

B is constantly babbling and making many different speech sounds.

B at 0;6—0;7

General and social. At 0;6 B weighed 21 lbs. and was extremely healthy, vigorous and lively; much shouting, apparently with joy. He laughs often in response to our laughter or even when we imitate his own laugh, and at 'peep-bo' game. Very sociable and mentally active now. Even when very hungry will stop after a few mouthfuls and look at us, or play with something. M cannot read a newspaper when feeding him; he will play with it.¹ Sometimes apparently cries for mere loneliness, or when taken by a stranger into a strange house. Comforted by presence of M or F. When in M's arms stares solemnly at strangers. Seems to find pleasure in regular rhythmic repetitions, e.g., if I make repeatedly a pleasant noise. Also beats his hand with a regular rhythm, as he does his foot when nursing. Seems entertained for long periods by my playing of piano. Croons on hearing singing. Gazed long at red wallpaper, finally turned away with a deep sigh. This sigh noted several times after concentrated attention.

Innate propensities, feelings and emotions. No fear of strange dog shown: held out hands to take hold of it. Watched a black hen with great interest and finally smiled at it: but later in month cried when a cow passed near him as he lay alone in cot. Stops his own crying (when hungry) by stuffing his thumb in his mouth. Squeals with delight in mere physical movement of rolling on the floor, a new accomplishment.

¹ Here, as throughout, Father is indicated by F and Mother by M.

Laughs repeatedly at seeing his mother or me in a paper 'cocked-hat'. Interested in baby girl of similar age: they held out their arms towards one another. Imitates some words spoken to him, and at times seems to imitate protrusion of tongue.

Movements and skill. Follows with his eyes his mother's movements. Hand and arm movements often well managed now. He plays 'peep-bo' game, covering and uncovering my face with a sheet. But movements are often convulsive and clumsy, e.g. he seems to snatch his hat off his face with one dashing movement; thus if he misses it his two hands come away from his face and then return to it. He does not first take certain hold and then move hands away.

Still sometimes misses by a few inches when he puts out his hand to grasp a spoon. Tries to reach a ring well beyond his reach. Enjoys mere rolling and kicking. Makes strong efforts to sit up, but cannot even when his feet are held down. Bangs things on table or floor apparently for pleasure of making a noise.

Learning, remembering, language and ideas. Looks for his toys when dropped, so possibly imagery has appeared. Smiles in pleasant anticipation on seeing a cup. Practises making different kinds of strange sounds, some he has never heard, e.g. a sound like Hallelujah! Also learning to say, and often practising, some names often heard, e.g., 'Dada' and 'Baba', but without as yet really associating them with their objects; yet there are signs of special interest in these very familiar sounds. Deliberate imitating of a word takes place in whispers. Repeatedly looked at M's reflection in mirror and then at her face and then back at reflection as though comparing. Unpleasantnesses quickly forgotten, e.g., put tooth-brush to mouth, made grimace as though very unpleasant: after a few seconds this repeated, and so with longer intervals (up to 20 or 30 seconds) for twelve times.

B at 0;9 to 0;10

General and social. Weaning has taken place quite easily. Sometimes cries when M leaves him alone, even if she has not been playing with him: also cried when I left him and M, though I had not been playing with him. Gazed as though fascinated at Dr. S. to-day (his second visit). No attention to M or F while Dr. S. here. Loves dropping toys for us to pick up. Tried repeatedly to pick up the shadows on the floor of his play-pen coloured balls, sometimes looking at his hand afterwards. Rarely sucks books or bigger toys now. Seems to fight against sleep: fell asleep sitting up one night, and another with his head over edge of cot. Another time his yelling suddenly stopped and we found him asleep fallen forward on his face.

Innate propensities, feeling and emotions. Imitates hand waving, and noise made by tongue clicking. Laughs when we imitate a movement of his. Showed no fear of hideous mask I put on: only smiled. In playing at new skills great persistence is shown—the germ of a non-personal kind of assertiveness. Thus he sets himself the task of standing up in his play-pen while holding his large rubber ball in his mouth. The ball kept falling but he would start over and over again. In simpler things per-

sistence was even longer, as when he threw a toy on the floor, and Miss L. picked it up, B threw it down again and so on for about fifty times, B laughing constantly. Incidentally this exemplifies the beginnings of social play.

Movements and skill. Stands alone, holding on to his pen rails, and can now move along thus slowly. Arms very strong, can drag his body along by one arm and elbow on floor. Carried bag with 7-lb. dumb-bell in it, with right hand.

Puts his hand through pen rails to get tray. He has learned to turn the tray vertical so that he can get it through. When I put a stick outside his pen, he pulled it first across the bars, then moved his hand to end of stick and so pulled it through. But next time he again seized middle of stick, pulled, and abandoned the stick.

Learning, remembering, language and ideas. Delights in making a new guttural sound. Says 'Dada' more frequently when F present. Also says it when he seems pleased with something. Says 'Ta' in imitation and, sometimes, when something is given him. Puts his hand out when I say 'Ta.' Waves when we say 'wave-handy'. Looked for his lost brush for over a minute, indicating the real functioning of an idea of an absent object.

At 0;9 B is constantly practising newly learned sounds; but he did this already at 0;7, that is earlier than A¹ and a little later than Y, in keeping with the order of development in language for A, B, and Y throughout. (See Chap. I, p. 13, for graph.)

B at 1;0—1;1

General and social. When he was between the legs of overturned chair he tried to reach fruit I was offering him: he could not and cried, but did not crawl back to get out of chair, just as hens press against a wire netting they could easily get round.

Shows great interest in pictures lately. Says 'bow-bow' to dogs in pictures. Reached towards his image in the mirror.

When B was crying for something M said 'Say ta.' He checked his crying at once and said 'Ta.'

Plays at giving us trifles: or teases me by pretending to give me a toy and then snatching his hand away laughing. Pulls M's hair and she screams; if she does not, B screams for her. Loves me to throw him up in the air.

Innate propensities, feelings and emotions. Screams (apparently fear) at loud noise caused by coalman dropping coal in box. Also afraid at first of clockwork donkey when it buzzed, but soon overcame this.

Great curiosity shown about his navel. Tried to wash it off with a sponge.

Imitates my smoking.

When he would not take his bottle M pretended to drink it. Instead of minding this he roared with laughter.

¹ A and C indicate B's brothers, X and Y his sisters, and so throughout this book.

Temper developed greatly of late. Screams violently sometimes when held for a moment in being dressed, or if he cannot reach a thing.

Movements and skill. Stands easily, and can kick a ball, with the right foot (only). Climbed one stair at beginning of month, and before end of month climbed whole flight alone. Walks three steps alone by end of month.

Can put stopper in bottle with right hand but not left. If stopper is put in left hand he changes it over.

As with animals, putting him through a movement (e.g. hitting cup with pencil) does not seem to teach him to do it, though he seems to be interested in the sound made.

Learning, remembering, language and ideas. Has now at least four 'tricks' which he does on command—'Clap hands', 'Show your toes', &c.

Snaps his fingers now, apparently at things he likes or wants, e.g. a picture of his father. Snapped his fingers and said 'Ta' at same time when asking for a plum.

Said 'Dada' when he heard my voice in the dark and so perhaps recognizes my voice. But *Dada* also seems a joy-play cry, and *Nan-nan* a cry for his mother or things she supplies. Says 'Ta' to me when he holds out a ball, and when trying to reach to his trumpet.

Makes sucking noises to get a drink.

Screamed for over ten minutes after touching dull bars of grate. Yet later in the day was making for it again.

Comparing my hair and his own, feeling first one and then the other.

B at 1;6 (1;5 to 1;7)

General and social. Mother still pre-eminent in his affections. Yet if he kisses M by request he insists on giving me one. At 1;5 when he had kissed M and me he took hold of my chin and pulled my face near M's, apparently for me to kiss her, and so several times.

When F away, hunted for him all over the house, calling 'Da-da.'

May throw his last toy out of the window and then cry, as though not yet restrained by thought of consequences. Developments at this period seems largely concentrated in speaking and understanding speech.

The heavy piano lid fell on back of his hand, but he showed not a sign of pain. I tried it and it hurt me greatly.

Innate propensities, feelings and emotions. Tries to imitate sound of trees in wind. No longer shy with strangers. A record of five minutes' continuous play at 1;7 is given in Chapter IX, p. 150.

The sight of his blanket, even at 9 a.m. when walking round the room, causes thumb to go into his mouth, apparently suggesting sleep.

Showed anger at being taken out of his bath. Struck at his mother.

First day of holiday on farm showed no fear of big dog even when it licked his feet, but cried when taken near cows in their shed.

Movements and skill. Very fond of 'playing' on piano. Loves climbing chairs, &c., in spite of many falls and hurts: but development at this period in motor adjustments seems in abeyance while there is greater concentration on learning of language.

Learning, remembering, language and ideas. At 1; 5 constantly pointing at things which interest him (birds, trams, &c.) and imitating their noises.

Shakes head in refusing. Asks for water by making sucking sounds. Asks (by grunting 'ä, ä') for hammer for harmonica. M did not understand so he made movements of hitting. At 1; 5 put two words together 'Ta, Dada.'

Great advance in weeks just before 1; 6 in understanding language rather than in speaking.

Understands a number of commands now (at 1; 6)—'sit down', 'come here', &c., but only verb spoken at 1; 6 is 'gī' (give) and perhaps 'ta'. Says 'na-na' for 'no'. At 1; 7 we suspect at times he says 'yes'. Calls pictures 'Dada'. (F had been away a week.) When I say 'look at the fly' he looks, but says 'Dickie'. Efforts to imitate have extended his speaking vocabulary. He imitated two words together a month ago. Has for some time made appropriate noise when seeing a horse, train, bird, &c.

On my return home after three weeks at once said 'Dada', but so he did when he saw a small statue.

Showed that he remembers there has been a canary in neighbour's room when he entered room again six weeks later, though canary had now gone.

B at 2; 0 (1; 11—2; 1)

General and social. When M was grieving because B had been sick, B ran for F then back to M, then to F again till F came to comfort M, when B seemed satisfied and began to play. Very distressed if we cannot understand something he is trying to say.

Calls several different kinds of pretty things 'pickby'. Enjoys picking out coloured wools as I name them. Loves to have things drawn for him till he recognizes them: then he takes no further interest in them and wants something else drawn. Calls his own scribble a 'gee-gee' or 'puffer' while drawing it, and when finished, with great pleasure, though it is a hopeless failure!

A day's record at 2; 1. (I had asked M to write a record of his speech for the day.)

'When first I came down he was calling "Maba" as he was alone in the kitchen. Told me he had a "pin dere" pointing to his throat (? he has a little cold). He was very bright, though, looking at a picture book and describing the picture something like this: "'Ik Boy Boo (little Boy Blue) more 'ik boy boo; girl got 'at, girl got toe-toes; four, five, 'ix toe-toes; gee-gee got 'un (funny) toe-toes," &c. Then named the letters he knew on the page, asking me those he did not know.

'Asked for his "ah-oo" (orange): watched me prepare it, giving directions, e.g. "oo in (sugar in) kekkie in" (hot water out of kettle). As soon as he got it—"Maba go 'way." (I always leave him to drink it alone while I dust rooms.) Talked a lot about going for a Ta-ta with Daddy and Maba. Repeated over and over again, "B go a ta-ta, Daddy, Maba play oot-ba (foot-ball) ? go up'tair (over railway bridge),

Maba gone (because I had not gone with them yesterday). B ta-ta Ayi bye-bye." Repeated many times in different orders.

'When being dressed said "Wash 'ace" for first time. Tried to say "face", making a big F noise, but could not do it properly.

'As soon as I suggested "breckie" B said "B get 'poon 'ower on (spoon with a flower on) B get Maba 'poon." Then "Milk in", running to the scullery where milk kept. Then "dat B's 'tair" climbing on to a kitchen chair—does not like sitting in his baby chair for meals now. Fed pictures in his book, coaxed to have more by my saying rhymes to him. Then F's bell rang—"Now B 'ee Daddy." Went upstairs with me. F asked for trousers so I gave him them to pass. Stopped on the way of his own accord and picked up braces to give Daddy too. Got his Daddy's dumb-bells. "Maba 'ee Daddy do 'dar-do." (Mother see Daddy do dumb-bells.) At our breakfast talked mostly about his toys gee-gee and puff-puff, &c. I said the new rhyme I first told him yesterday and he put in the last words. Say "'gain" each time. Repeated several times. Then he drew triangles, &c., running to show them to me.'

Innate propensities, feelings and emotions. Imitates animals and people seen in pictures.

Play activities include arranging bricks in 'straight line' or in a design of curve and dissecting line; builds a tower. Most notable development in play is a passion for drawing things with a pencil.

Plays at assertiveness. When M asked 'Does B love mummie'—he shouts 'No!' Then B suggested 'Daddie'? and when asked 'Does B love Daddie?' he says 'No!' and so with 'pussy' &c. No fear of the dark shown so far. But fear of even quiet sea-edge shown at 2; 2.

Movements and skills. Quite suddenly one day a new method of drawing appeared, B using his pencil very slowly and carefully, instead of hurried scribble. Setting him a copy of something he wants to draw, e.g. a man or 'puffer', now seems to improve his own attempt. Can put his own shoes on. Can turn a key in lock, but cannot open a door by turning handle. Plays piano with both hands simultaneously.

Learning, remembering, language and ideas. For a month now (2; 0) has often used three words together, and at times even four, e.g. 'Annie dear, baby (shut) door'. 'Maba get more bricks.' Uses 'two' correctly at times but sometimes it apparently means 'several': this is before he can use 'one' correctly. Usually names correctly a square, circle and triangle. Very excited once at spotting that his piece of bread was a 'triangle'. Names coloured wools correctly—red, yellow, blue and green.

Constantly asking names of things. Knows the names of the 26 animals on his picture bricks, though his pronunciation is very bad. Says 'yes' in answer to questions usually correctly. Uses 'now' correctly. Loves to be told nursery rhymes, and supplies the last word of each line right through. Uses negative freely, often at start of sentence, e.g. 'No Daddy go ni-ni.' Signs of understanding certain time-relations—e.g. 'by and by', 'now', 'B been ni-ni' (after he has got up).

B at 2 ; 6 (2 ; 5—2 ; 7)

General and social. After travelling some 70 miles in train from our holiday farm, B asked to 'Go see Emma' who had lived near the farm; he seems to have no idea of the distance he had travelled.

Sometimes comes to M (or F), puts his arm round her (or his) neck and says, 'B like Mummy' (or 'Daddy'). Very thoughtful for us now: runs to get my slippers; very sympathetic if we hurt ourselves slightly.

Describes an obviously genuine dream, very different from and superior to the stories he makes up.

Innate propensities, feelings and emotions. F showed him a pretty green caterpillar. He showed signs of disgust and said 'Dirty caterpillar'; this without suggestion on my part. Showed no disgust of earwig till I did, when he imitated my 'ach!' and would not go into shed where earwigs were, to get a toy he wanted.

At my suggestion readily gave old toy to poor boy—seemed very pleased to do so. But later wanted it back and nearly cried. This was at 2 ; 5. A month later suggested he should give some toys to the same boy; and this time did not cry. Picked up a tortoise, but dropped it on floor hurriedly when it put its head out. Afraid when I made a moaning in the dark: said 'No, no, Daddy.' Paddled into sea with me but showed some signs of fear. Afraid to go into dark bicycle shed even with me, though he has never shown fear of the dark in his own bedroom. (Perhaps he remembered seeing earwigs there.)

Movements and skill. No special new developments noted at this period. In copying a square he now manages three sides with recognizable right-angles. Has recently begun to build more elaborately with his bricks.

Learning and remembering, language and ideas. Tried hard to imitate new words we teach him. When he gets a word right he shouts it triumphantly. Speech includes conditional sentence (without 'if'). Also 'too much'. ('Had too much brekkie.') Often uses *I*, *me* and *my*, but sometimes says 'your' for 'my'. Suddenly began to aspirate the 'h' in all words in which it is sounded.

Easily repeats after F three non-consecutive numbers, the Binet test for four-year-olds. But *four* numbers so bother him that he does not get the first three right.

Sometimes says 'I *not* will,' at other times 'I will not.' Said 'See animals in chair' (including cat, dog, bird, &c.). But when I took up the cat and asked 'Is that an animal?' he replied 'No, pussy.' Constantly asking 'What(s) that?'

On passing through railway stations he remembered poster of fox dressed as a man which he saw at a railway station two weeks ago and only once. As we passed each station kept asking 'Where fox?'

Begins to use 'because'. New ideas of time appearing; e.g. 'B went ni-ni Mummy *last* mornings' (yesterday morning).

B at 3 ; 0 (2 ; 10—3 ; 2)

This period seems to have been one of stability and consolidation so that there are relatively few notes of *new* developments. In view of this I may add that at 3 ; 3 B's results in the Binet tests were as follows¹ :

Four-year tests. *Passed* : (1) Naming of penknife, penny and key. (Third Year.) (2) Repeating three numerals (B managed *five*). (3) Counting four coins (B counted up to ten). *Failed* : Drawing a square. (Fifth Year.)

Five-year tests. *Passed* : (1) Which of two faces is the prettier ? (Four Years.) (2) Repeating ten syllables (B repeated thirteen. Burt requires twelve.) *Failed* : Arranging two triangles to form an oblong. (Sixth Year.)

General and social. M gave him a sweet. When he begged for another M said 'No, you shall have one another day' ; B said 'I call you Daddy (if) you say I have one 'nother day' (a kind of remark F often makes to him). Says 'I'm so sorry' when any one else lets anything drop or makes other mistakes, or when he falls and hurts himself ; so it is a matter of routine and not apology. Has learned to give hints for things instead of asking directly. Behaviour towards M now very different from that towards F. Argues with M and teases her.

When F was revealing his true identity after playing Santa Claus B begged 'Don't do that. Don't be Daddy.'

Innate propensities, feelings and emotions. When given a sweet said 'What about nurse have a sweet ?' When F pretended to cry he cried too and smacked F, apparently to make him stop. Loves teasing the kitten, although he loves to feed it. Plays with emotion of fear : e.g. gets F to play at lions till he (B) screams with fear ; then he asks for the game again.

B was asked to sing his little song to friends but refused. When offered a sweet if he would, he started, then overcome with shyness ran to F's knee and hid his face saying 'No, I can't.'

Movements and skill. Mastered the Montessori cylinder in about a quarter of an hour. Then pretended it was a steamer. Takes great pleasure in mechanical toys which he can now wind up. Makes (at 2 ; 11) a just recognizable copy of a square and circle.

Learning and remembering, language and ideas. Constantly asking 'Why ?' (2 ; 10). Cried for something and later asked 'Why me cry ?' Has used all parts of speech for some time, including prepositions. B saw his reflection in tram window and asked M why he could ; seemed satisfied with reply that it was 'like a looking-glass'. Counted correctly eight donkeys each with a boy on its back, but could not then tell me how many boys there were.

¹ The revised arrangement in my *Experimental Psychology* (1st ed.) was used. I give in brackets the year to which Burt assigns the test in his revised list in *The Sub-normal Mind*, Appendix II, if it is different.

APPENDIX II

Right- and Left-handedness

This is not the place for a full discussion of left-handedness, but I include the notes as new evidence from the earliest days. Professor Burt writes: 'The data you give are, I think, most valuable. I fancy most of us had assumed that a difference in handedness did not appear until between the ages of 6 and 12 months, i.e. when the child was beginning to grasp things. The popular notion is that, since righthandedness implies the functioning of the left cortex, and the left cortex apparently matures about the time of the appearance of speech (since Broca's area is in the left cortex), therefore the innate preference for the right hand synchronizes roughly with the beginnings of speech. This is a pretty theory, but, just because it is so pretty, I have always been inclined to doubt it. Your evidence on thumb-sucking and the like seems definitely to show that the bias may exist from the very start.'

(R stands for Right Hand, L for Left)

These notes refer to B unless otherwise stated. Both A and B developed into normal right-handed persons. These notes are given as evidence of very early differentiation in the development of the two hands.¹

d. 5. Neither M nor I have seen him suck L yet, though nurse says he does. [A sucked right thumb 7th day: not taught.]

d. 65. [A sucks knuckle of finger on R and has done frequently last few days. M has never seen him suck L yet. It stops in now as it used not to.]

d. 65. Took a very firm grip of my finger with R but only after some time could I get him to do same with L, and then it was very lax. R kept hold even when I pulled his hand up and down and sideways.

d. 65. 6 p.m. Again R grip stronger than L; L gives way sooner. I noticed that as he was lying in cot he was holding R with thumb clenched outside (boy's grip) but L thumb was inside fingers (girl's grip).

d. 65. [M says boy's grip not noticed in A yet, except momentarily to-day in R.]

d. 66. Both hands boy's grip. Later, boy's grip in R, girl's grip in L.

d. 67. He sucks his right fist more often now.

d. 72. When bathing him M says she can open L much more easily than R.

¹ A full discussion of this question in later childhood will be found in Burt's book, *The Backward Child*, Chapter X. Burt emphasizes the fact that it is 'important to detect left-handedness at the earliest possible moment' (p. 272).

d. 75. Sucks R a good deal : when it is withdrawn carries it steadily back to the mouth or its immediate vicinity, when it slips in. He did not suck left fist when that was substituted—indeed, there was resistance to movement, though later when both hands lying quiet, there was no resistance to movement.

R seems generally more active than L.

d. 80. R when taken away from mouth goes slowly but steadily back to right side of upper lip and there moves along into mouth. The L moves up more jerkily after the R to near mouth. But there was no movement of L, when I held R fast, as a substitute for R.

d. 80. Right fist grip is 'boy's' and left 'girl's' again.

d. 93. [A. Reflex grasping in sleep with R but not L.]

d. 95. [A. I put a first finger in each fist. L held it steadily almost all the time—a minute or more, but the R relaxed every now and then and gripped again. R relaxed certainly four or five times to L's one.]

d. 96. Pencil put in R—taken up to mouth almost at once (three times). Pencil put in L dropped after a few seconds (twice).

d. 100. [A. Noticed the R moving about even when I talked to him, but L perfectly still.]

d. 128. [A sucks his fingers and thumbs (left as well as right).]

d. 128. Not nearly such accurate grasping with L when rattle was held in front of left shoulder ; though L was moved, it was waved upwards wildly till it hit.

In grasping at central object, R seems predominant, though L generally comes along soon after—sometimes coincidentally reaching object.

d. 137. Now grasps with L thumb opposed.

d. 139. While being dressed got hold of right toes with R—L only reaching knee of left leg—and trying to grasp it. (L less-developed as always.)

d. 142. Grasping toes with R and L.

Got hold of right toes with R easily—L only succeeds in getting near, or taking knee.

L just gets toes momentarily, seeks for them again, fist moving too.

d. 149. Sitting in flat chair B was greatly interested in wooden pillars of chair—held one with R and wriggled over on side to bring his L to it as well.

At this date I began a series of tests to see which hand B would use in 'playing the piano'. I sat him on my knee, and played some notes myself, and then encouraged him to try, sometimes holding his hand and striking a note with it. My wife made notes as I called out which hand was used.

d. 150. At piano, 3 minutes at least, I only pushed his L down. He struck notes 6 or 7 times to-day, though it seemed by accident. No apparent attention to hands when they struck.

5 p.m. seated by piano, in 3 minutes notes struck by L 4 times, by R 12 times. As previous time I only pressed down L. Again striking seemed accidental ; no looking at hand. Only one or two cries of pleasure at notes.

d. 151. Piano, 3 minutes. L 5—R 6—again seemed accidental. Wiggling about to see me; did not seem as interested to-day as first time. At this age I also began similar tests with A.

Summary of tests at piano : 0;5 to 0;6

Number of times hand used by :

d.	B		Total
	Left	Right	
150	4	12	16
151	5	6	11
153	16	14	30
154	37	47	84
155	10	64	74
156	35	59	94
157	17	31	48
158	19	31	50
162	4	47	51
164	14	14	28
174	13	34	47
Totals	174	359	533

d.	A		Total
	Left	Right	
154	6	20	26
	9	7	16
	19	10	29
161	26	36	62
161	20	12	32
161	25	37	62
Totals	105	122	227

[d. 151. A at piano about 3 minutes. I pressed both R and L down. Then he struck notes thus :—L 1, R 5. Not much interest in sounds.]

d. 155. At piano. Not quite so good a mood to-day at start, had been crying a little, possibly not finished feed which had just been given him. At first evident desire to get at piano when he saw it. He began slowly, looking up at me nearly every time he played a note, and during last minute or so he was playing almost as fast as M could record. This time left strokes were nearly all with right at same time, but were counted separately.

d. 156. More of L alone this time. Goes much too fast for me to indicate which are separate. Many and hard strikes now, striking down 2 or 3 notes. Did not look at piano so carefully during last 2 minutes as at start.

d. 157. L gets more exercise nowadays (e.g. waving dress to and fro) while right thumb is sucked. Never sucks left thumb. He is not able readily to pull down his rubber ball (which hangs above him) yet, though well within his reach.

d. 164. Sucked left thumb last night; first time for many weeks.

d. 170. I held a spoon over left shoulder or elbow, some 8 inches above him as he lay. Three times he brought R (and head and body) round to it, not L, though much nearer. Even took thumb out of mouth to bring R to it.

Use of hands in colour grasping tests. When B was 0;7 I began a series of experiments with colours. Pairs of coloured wools were placed in front of him and notes taken as to which he grasped.

At first B used almost exclusively the R, choosing generally the colour on the right. I attempted to get over this difficulty as follows. One wool was placed about three inches to the right and the other about three inches to the left of a point immediately

Summary of Colour-grasping Tests

	Number of grasps		
	Right hand	Left hand	Both hands
1st set of 6 experiments . . .	45	14	1
2nd „ „ „ . . .	58	2	0
Totals	103	16	1
3 experiments with both wools placed to the right of B. .	19	9	1
3rd set of 6 experiments . . .	3	45	10
4th „ „ „ . . .	11	39	10
5th „ „ „ . . .	10	41	9
Totals of Experiments 3, 4 and 5	24	125	29

in front of B's right shoulder, so that each wool was about equally well placed for grasping with the R. Strange to say, this method had not been in use for more than two sittings when suddenly, on the occasion of the 16th sitting, B began to use his L more than his R. In spite of the unfavourable position of the wools for the L the L was used seven times and the R only three times at this sitting. I therefore at once reverted to the original plan of placing one wool immediately opposite to each shoulder, and this arrangement was used throughout the remaining experiments. The new preference for the use of the L continued to the end of the experiments.

The table above shows the actual figures. It should be compared with the table given by Myers showing the growing preference for the R on the part of his child up to the 13th month, in spite of an earlier preference for the L.¹ McDougall also remarked that his child L was by nature left-handed, yet used the R somewhat more frequently in the similar grasping experiments.²

In a later series of 'grasp and reward' experiments immediately following, B at 0; 8½ was still more addicted to the use of the L, the figures for the last 120 grasps being: R 15, L 105.

We revert now to daily notes.

0; 7½. d. 225. Sudden activity of L to-day in colour-grasping experiments.

¹ *Brit. Jour. of Psych.*, Vol. II, p. 357.

² *Ibid.*, p. 343.

d. 226. L again very active to-day in colour experiments. Sat him at piano—began thumping at once—with flat hands—both at first, then R much more than L, which however joined in occasionally.

d. 230. Piano test—struck piano 100 times with R (in about 3 minutes) and only twice with L—great pleasure; yet he is using L more than R in colour experiments.

d. 232. Yesterday was using right forefinger (rest closed) to investigate hairy surface of my leg—a strange kind apparently.

o; 9½. d. 286. I put 7 lb. dumbbell in little brown bag in front of B sitting on floor. Seized with both hands, but three times carried it round with R, L not following. When bag was put to left, L seized it, but R was at once brought round to help. Clear predominance of R with heavy weight.

d. 362. Has learnt to kick ball, but only with right foot.

1; o. d. 368. I have observed carefully that when walking he seems to take a step forward more frequently with right foot. Often only brings up left to level of right or very little beyond. More often left waits till it is far behind body.

d. 373. In turning leaves of a book R used for deliberate movements, e.g. turning over—L mainly for holding book.

d. 378. Given new toy, a scent-bottle. At once succeeded in putting glass stopper in with R, but not later with L. Twice when bottle was put in R and stopper in L, he changed over as though conscious of greater skill in R, though bottle was much the heavier of course.

1; 1. d. 400. Cries when tired for right thumb to suck—it is still bound up in glove; will not use his left thumb for this; good as soon as right thumb free to suck. L now used to pick up crumbs, &c.

d. 409. Points with right forefinger at things he wants. (Has now got bandage off R.)

1; 7½. d. 589. In going upstairs he raises right foot to higher step and then brings up left, unless you get both hands under his arms, when he walks up properly, having so much greater support.

2; o½. d. 752. Observed to be drawing with L.

[d. 750—Y in form-board tests always uses L. (Y became normally right-handed.)]

2; 1. d. 772. Plays piano now with both hands equally, lost old habit of using only R.

2; 4½. d. 870. R always used for drawing, though this never pressed on him. At my suggestion he has just tried with L but soon transferred pencil to R again. Tried L again at my suggestion, and then used both.

4; 10. Writing words, copying from his reading book; made a complete sentence from right to left, thus:

PAT HAD A FAT RAT

APPENDIX III

The Earliest Dreams of B

These records are included as there seems to be no such collection of the very beginnings of dreams. Some Freudian principles might be checked if such data were available for a larger number of children. The references are always to B, except when otherwise stated. It will be seen that some of the dreams are wishfulfilments (sometimes only partial), or dreams of adventures and fears, in a boy remarkably courageous in waking life (see the chapter on Fear).

2; 3. M heard him in his sleep (early morning) saying, 'Let B make pies.'

2; 7. Woke up about 5 a.m. saying, 'Where pussy cat? Pussy cat gone away.' Then he told me a long story how 'boy pulled pussy cat's tail'. 'Boy took pussy cat away in arms; boy said coming back minute.' Very excited and only coaxed to sleep again by my saying he would perhaps see it again. This dream was not mentioned again all day after first thing in the morning, but when I put him to bed at night he said, 'Perhaps see pussy cat again.'

3; 8. At breakfast he said he saw 'in his bed' (presumably a dream) a lot of ladies trying to put him down a big hole and they couldn't; and a lot of soldiers with big mouths open were tramping over him, but they did not hurt him.

This quite unlike any of his waking stories which are feeble and commonplace.

[C, 3; 9. Undoubted dreams recently. Two days ago I was playing at dragons, pulling faces and chasing him. He found it fun at first, then showed fear. Next morning he told M just after waking he had dreamt of 'Jagons' with two heads. He had similar dreams last night.]

3; 10. Dream told spontaneously as soon as coming into my bedroom. 'I saw a big dickie sitting by my bed. I went out and when I came back it was dark and I shouted ever so loud and there was a very naughty ugly man there, like the skin man, and he smacked me hard, and then he brushed me on the back with a prickly hair brush and I nearly cried.'

A few days later: Last night he wakened when we went into his room at 11.30 p.m. and said, 'I dreamt I saw a window full of apples', 'and I dreamt I saw a lion running up the road looking for some children to eat'.

F: 'Didn't he eat you?' B: 'No, I wasn't there.' F: 'Well, how did you see the lion?' B: 'Oh, it was just a dream.'

3; 10. Ready and fluent description of dream of horse. 'Oh, Daddy, do you know what I dreamt about? a "horsey" and it was all by itself, no cart, no driver, and it was running about, and Annie said "Oh,

dear me," and its master was just behind it. It was running all over the pavement and (he added, smiling) when its master came it didn't run on any more.'

3; 11. Always dreaming now. Last night dreamt that a bear chased him and caught him; also about a traction engine with carriages.

3; 11. Dreamt the other night of coming downstairs without his feet touching the stairs; and then he pushed a little boy down the stairs.

3; 11. Said yesterday: 'I dreamt I was throwing sticks into the river (he often does) and I fell in and I tried to get out and I couldn't and I nearly cried, and then I got out, and I met the fairy of the sea, and his face was all over hair (he saw a dressed-up Father Neptune at Christmas) and I was frightened, and he tried to put me in a shawl, but I ran away and sat on a chair in front of S.'

4; 0. Dreamt last night that the new maid (due to-day) came and she was jealous. Asked to explain 'jealous' he could not, even when I said 'When are you jealous?' Also dreamt that he saw a fire-engine, 'a real one, and it took all to pieces.'

4; 1. B said: 'I dreamt Daddy sent me out alone on a message to get a letter, and the letter came out of the envelope so I had to throw the envelope away, and I lost the way and didn't know which was our road, and then Mary came with S to find me.'

For comparison I record a *typical story* by B: 'Once there was a little boy and he lived all alone with his Mummy and Daddy, and they had no Annie and Mary and Mollie (names of present or recent maids), and so the Mummy had to cook the dinner, and they were all as happy as the daytime could be. And they hadn't much toys—and that's all.'

4; 1½. Dreamt 'Two dogs came into the house and Mary drove them out of the front door, then I hid in the coalhouse for a horsie was coming round the garden. Then a great big "poley" bear came and gobbled us all up except Daddy and Mummy and S. And then it pulled a funny face because it was going to die.'

4; 1½. Dreamt last night that a lady gave him a purse and he was so pleased because he thought there were sweeties in it, and he opened it and there was nothing in it.

4; 2. Dreamt that he met a little girl he knew and she knelt by him on the pavement to talk to him. 'Who was she?'—'I don't know, I knew her in my dream.' Said she was 'such a nice little girl'.

4; 2. Dreamt that Daddy, Mummy, S and himself were all 'in our bare tummies', 'but not Annie and Mary'.

4; 2½. Described a dream. He went down the drain of the bath and he heard Daddy saying 'Where's B? Where's B?' M: 'Did you cry?' B: 'No, I couldn't, I was down the drain.' M: 'Were you drowned?' B: 'No, I wakened up.' M: 'Was it a nasty dream?'

B: 'Oh, no, it was a funny dream. I wanted to look at it. I kept my eyes shut so that I could see it.'

4;3. Dreamt that a big man with gun was going to kill him and he (B) shouted 'No' and then man ran away and jumped into his boat. I asked 'Where was the boat?' B: 'On the sea.'

4;3. Dreamt that Mummy was better and up again (later said 'young again') and he (B) went out in his trousers and pyjamas. (Did he like it?) 'No.'

4;3. 'Dreamt we had a summer dinner house outside and no doors would shut and it was fine every day, and we had two pussies and they pulled every long thing I had on, my coat and tears (of the coat) and all. And I had a naughty dream. I dreamt there was some one with a face just like Eileen (a friend), and then a nice place and a whole lot of sweets outside and she said "Ugh ugh" and it wasn't Eileen at all, it was S, and I went and pushed a tram over and the men were taking me away in a horse (explained as "horse and cart") and I jumped out and told Mummy and it was morning then.' I asked why it was a naughty dream. B: 'To push tram over.'

4;7. A man came on a camel and ate another man who was hiding under a chair. Then he came and said to me 'I'm going to eat you too.' I said 'It's only a dream, isn't it?' and he said 'Yes.'

4;8. Repeated yesterday a dream he had at least eight months ago which he had not mentioned for a very long time.

4;8. Dreamt that Baby could crawl and put her hand to the fire and he screamed 'Daddy, Daddy.' (I said 'Was there really something the matter?' and B said 'Yes.') Daddy came but it was too late; Baby was burned; but Daddy said with some water we could get her back, and he fetched two pails of water and got her back.

Dreamt that mother said 'Let's play water-babies and we did, and I was trying to catch a fish and there was black salt, the water made it black, and there was a girl there with a chocolate shop and she threw open the doors and we got some, and there was water-babies' cake, and it was hard, hard; but it was nice.'

4;9. Dreamt he was an orphan. (Said he liked it because he wanted to know what being an orphan was like.) F: 'Did you like being an orphan?' B: 'Yes.' F: 'Weren't you sorry to have no father and mother?' B: 'Oh, I was only pretending I was an orphan.' F: 'Then you didn't really dream it?' B: 'Yes, and I heard myself say "and I'm only pretending I'm an orphan".'

4;9. Dreamt he was on board ship and it was very rough, and M was bathing baby and M heard a noise and thought it was the Red Cross but it was only the noise of the waves. Later heard it again and it *was* the Red Cross. It was Auntie May and she gave a big sigh like this (imitated it).

4;9. B said 'I dreamt I was in the nursery with S and I was putting wood on the fire. S put his hand in the pit (ashes) and when he took it out it was covered with flames and I touched him and got them on me, and we

kept giving them to one another, and I tried to bring him to you and then I woke.'

4; 9 'This was a nice dream. I dreamt there was snow on the ground, and on the trees and hills and on the dicky birds because they fly so high up.'

4; 10. Dreamt he was in a boat with Mummy and Daddy and the boat sank and went down and Mummy and Daddy cried because they were drowned, but he climbed up and came home.

4; 10. Dreamt he could ride a bicycle by himself.

INDEX

In this book the indexing of names presents a peculiar difficulty ; for the detailed reports on children by Stern, Preyer, Shinn, D. R. Major, G. V. Dearborn, K. C. Moore, and Sully are cited on scores of pages, some of these having nearly a hundred references each. A list of a hundred page numbers by, say, Stern's name would be of little value, and a complete index would be too cumbersome. I therefore only give the references to a few specially important conclusions quoted from some of these writers. The reader may assume, however, that he will find other references to some or all of these writers on almost any topic.

- Abilities, special, appearance of, 10
- Adler, A., 4, 19, 22, 306
- Adoption of defective children,
 - danger of, 4
- Affection, 301
 - and love, 301
 - for animals and dolls, 306
 - inexplicable by association, 305
 - towards infants of similar age, 302
 - towards younger infants, 303
- Albanian children as evidence for
 - maturation, 45
- 'Although', early use of, 464
- Anger, and distress, 268
 - earliest signs of, 266
 - growth and control of, 275
 - independent of pugnacity, 270
 - play at, 159
 - and pugnacity, 265
 - and pugnacity at, 1 ; 0, 2 ; 0 and 3 ; 0, 271
 - and pugnacity, sex differences in, 277
 - signs of at 1 ; 0, 269
 - variations with age, 275
- Animism, 153
 - in the idea of physical causation, 459
- Anthropomorphism, in idea of
 - physical causation, 459
- Anticipatory developments, 55, 116
- Apes, absence of imitation of
 - speech among, 391
 - sympathy of, 299
- Askar, R. M., 460
- Associations, with colour, 357
 - first, 70
 - in the first year, 353
- Associations, through one experience, 356
 - with sight, 71
- Associations, with sound, 72
- Assertiveness, early signs of, 279
- Auden, G. A., 333
- Auto-suggestion, 225, 261
- Baldwin, J. M., 18, 172, 181, 255, 262, 288, 354, 488
- Barber, H., 27, 438, 440, 452, 454
- Barcroft, Professor, 62
- Bartlett, F. C., 362
- Bath Child Guidance Clinic, Report of, 15, 17
- Beasley, W. C., 111
- Bechterev, V. M., 121, 137, 256
- Beer, G. R., 51
- Behaviourists' method, 39
- Bergel, E., 335
- Bergson, 232, 238, 240
- Bernfeld, S., 63
- Berry, R. J. A., 4, 11
- Binet, 254
 - tests, 7, 260
 - results with Y, 9
- Biographical studies of infants, need for, 29
- Birmingham Child Guidance Clinic, Report of, 16
- Blanton, M. G., 20, 79, 83, 84, 87, 92, 102, 131, 293, 336
- Blatz, W. E., 86
 - and others, 371, 385
- Boenheim, C., 337
- Boyd, W., 226
- Bradley, F. H., 431
- Brash, M. E., 27, 209, 436, 440, 443, 452, 454
- Bregman, E. O., 221
- Bridges, K. M., 84, 88, 169, 263, 268, 271, 275, 278, 285, 294, 299, 338, 341

- Bühler, C., 10, 31, 45, 87, 154, 236, 293, 337, 355, 381
 Bühler, K., 142, 152, 225, 425, 443
 Burns, C. L. C., 16
 Burt, C., 10, 15, 20, 23, 24, 33, 52, 101, 161, 163, 202, 225, 245, 261, 331, 337, 391, 456, 469, 504, 505
 Burt, H. E., 359
 'But', early use of, 464
 Carmichael, L., 62
 Castration complex, 339
 Causation, animism and anthropomorphism in idea of, 459
 of physical events, apprehension of, 442
 Chapman, A. E., 27, 194, 222
 Chaney, L. B., 115
 Chesterton, G. K., 249
 Child Guidance, 14
 Clinics, Possible causes of 'cures' in, 16
 Child Psychology, value of, 1 ff.
 Coghill, G. E., 58
 Colour, discrimination, 488
 early delight in, 95
 learning names of, 490
 Communication of ideas by a child, 453
 Comparison, rudimentary, 422
 Concepts, first, 423
 Counting, 470 ff., 477
 intense interest in, 475
 Cries, the first, 84
 early differentiation of, 368
 Cruze, W. W., 44
 Crying, in early weeks, causes of, 86
 inhibition of, 117
 resentment of, in another, 297
 in response to crying, 293
 as a sign of sympathy, 298
 Curiosity about sex, 317, 318
 Dada, as expression of feeling, 379
 Daniels, E. E., 78
 Darwin, C., 72, 86, 87, 205, 214, 229, 232, 237, 290, 353, 400
 Davis, E. J., 388
 Dawson, S., 53
 Day, E. J., 388
 Dearborn, G. V. N., 87, 92, 122, 290, 361; and *see* note at head of Index
 Defaecation, supposed sexual significance of, 343
 Definitions, 455 ff.
 Delacroix, 392, 401
 Dennis, W., 45
 Descœudres, A., 469, 480
 Development, definition of, 42
 intermittent, 54, 154
 regular sequences in, 51
 stages of in B, 495 ff.
 Developments, alternation of specific, 59
 anticipatory, 55, 336
 Dewey, E., 55, 61, 62, 63, 68, 87, 100
 Dionne Quins, 148, 371, 388
 Discipline, effect of irregular, 276
 and relation to parents, 326
 Displeasure, in first months, 85
 Drawing Tests, performance in, 11
 Dreams, early memories revealed in, 365
 Drever, J., 101, 172, 196, 198, 301, 367, 405
 Dudzycha, G. T. and M. M., 362
 Einfühlung, 444
 Ellis, Havelock, 251, 337
 English, H. B., 208
 Erections, in infancy, 336
 Etzioni, M., 159, 273, 277, 283, 307
 Experiments, children's love of, 38
 with colours, 488
 on defence movements, 77
 on fear, 203, 216 ff.
 on imitation at 1; 0, 189
 on imitation of sounds, 174, 390, 404
 on infants, value of use of, 37
 on instability of reflexes, 128
 on judging expressions of infants, 88
 on learning through touch, *versus* learning through sight, 484
 on perception of shape by touch, 481, 483
 Experiments, on perception of sound direction, 73
 on purposive imitation, 198
 on remembering direction and position, 363
 on suggestion, 263
 on use of prepositions, 411
 on use of right and left hands, 507

- Expressions of displeasure, differentiation of, 88
 of early feelings, 84
 of feelings, increasing differentiation of, 98
 individual differences in, 97
 of pleasure, 91
 variety of, 94
- Eye movements, reflex or controlled, 110
- Family and problem children, 15
 relation between infants of the same, 305
- Father, growth of affection for, 313
- Fear, of animals, 212, 213
 conditioned, experiments on, 216
 of the dark, 209, 224
 distinguished from shyness, 289
 exceptional absence of, in B, 226
 experiments on, 204, 216 ff.
 gradual differentiation of expressions of, 228
 of high places, 211
 hysterical, night, 18
 and imagery, 226-7
 individual differences in, 227
 influence of experience, 204, 213
 of general conditions, 209
 of maturity, 204
 inhibiting by familiarity, 205
 innate nature of, 218, 219
 of novel sounds, 207
 of pain, 211
 playing at, 228
 of the sea, 222
 signs of, 39, 205
 of sounds, earliest signs of, 205
 and suggestion, 220
 summary of conclusions on, 229
 of the uncanny, 216, 221
- Feelings, expressions and causes of
 after six months, 97
 nature of first, 84
- Feelings, quick alternations of, 95
- Fenton, J. L., 71, 147, 355, 356, 387, 397
- Féré, 490
- Finger-grasp as a test of development, 109, Footnote
- Foetus, activity of, 62
 reflexes of, 56, 62
 response to sounds, 63
- Forbes, H. S. and H. B., 63
- Freedom schools, observation of children in, 36
- Freud, S., 5, 22, 23, 34, 150, 158, 232, 240, 241, 305, 316, 318, 325, 335, 333, 340, 343, 351, 352
- Friedländer, H., 462
- Froebel, 164
- Generalizations, at 3 years used in reasoning, 447
 first, 435
 of terms, 425
- Gesell, A., 3, 6, 8, 9, 11, 14, 21, 30, 42, 45, 50, 52, 53, 59, 103, 109, 122, 124, 154, 193, 200, 205, 333, 375, 390, 397, 495
- Gesell Tests, agreement of with Binet Tests in case of girl Y, 9
 results with girl Y, 9
 stability of I.Q.s with, 7
- Gesture language, 375, 388
- Gillespie, R. D., 15, 22
- Ginsberg, M., 2
- Glover, J., 351-2
- Goodenough, F. L., 7, 268, 275, 278
- Gordon, R. G., 4, 11, 15, 339
- Grammatical classification, difficulties of, 406
- Groos, K., 140, 141, 241, 426
- Growth, meaning of, 42
- Habits, development from spontaneous movements, 78
- Hadfield, J. A., 333, 337
- Hall, E., 166, 170
- Hall, Stanley, 203
- Hallowell, D. K., 6
- Halverson, H. M., 104
- Harrison, A. L., 27, 209, 226, 271
- Hatwick, L. A., 338
- Hazlett, V., 450, 451
- Head, H., 85, 116
- Hearing in the new-born, 63
- Heredity, neurotic, 23
 Note on, 24
- Herodotus, 43
- Hetzer, H., 10, 222, 337
- Hilgard, J. R., 45
- Hill, M., 269
- Hirsch, H. D., 23
- Hobbes, 231
- Hobhouse, L. T., 78, 394, 425, 428

- Hoffding, H., 234
 Hollingworth, L. S., 3, 10, 21
 Hollingworth, H. L., 84
 Holmes, F. B., 224, 227
 Home, value of study of children
 in, 30, 36
 broken influence of, 15, 16
 Hughes, E. H., 224, 307
 Hume, 441
 Hunter, W. S., 363
 Huxley, J., 44
- Ideas, of actions, 426
 free, 421
 Ilg, F. L., 333, 375
 Imagery, 422
 vivid, at night, 226
 Images, early visual, 354
 Imitation, of definite sounds, 178
 divergent views on, 172
 early, of movements, 177
 experiments on at 1; 0, 189
 ideo-motor, 186
 imaginative, 186, 201
 and insight, 181
 and interest, 182
 latent period, 183
 of movements, 0; 6—1; 0, 179
 in play, 149
 primary, 173
 among adults, 201
 purposive, 173
 experiment on, 198
 rational or purposive, 197
 reflex, 187
 responsive, 185
 self-abasement, 196
 of sound making, 174
 of sounds, experiment on, 390
 of speech, 390
 suggested theory of, 183
 suggestion, 186
 test in speech, 404
 of tongue protrusion, 177
 Individual differences, in expres-
 sion of feeling, 90
 among the five children specially
 studied, 28
 Inferences, early, 447
 Inhibition, of crying, 117
 of reflexes, 117
 significance of, 119
 of spontaneous movement, 75
 Innate differences and abnormali-
 ties, 19
- Innate differences in the new-born,
 20
 elements in human nature, criteria
 of, 1
 impulses, active sympathy, 300
 physical defects, 20
 propensities and emotions, 496 ff.
 tendencies, *see under* Fear and
 shyness
 primitive passive sympathy,
 295
 Instincts and reflexes, distinction
 between, 132
 Instinct, use of the term, 101
 Intelligence Quotient, stability of
 in infancy, 6
 testing in the first year or two, 6
 tests for infants, need for research
 on, 8
 Isaacs, N., 441
 Isaacs, S., 5, 35, 322, 335, 338, 339,
 341, 443
 Ischikawa, T., 93, 193
- James, W., 43, 142, 213, 462
 Janet, P., 16, 258
 Jealousy, 316, 327, 329
 of new-born baby, 305
 Jersild, A. T., 224, 227
 Jespersen, 367
 Johnson, W. E., 431
 Jones, D. T., 87
 Jones, H. E., and M. C., 203
 Jones, M. C., 90, 208
 Justin, F., 243
 Juvenile delinquents, 23
- Kanner, L., 3, 227, 292
 Kant, 84
 Kasatkin, N. I., 72
 Kellogg, W. N. and L. A., 147, 148,
 149, 150, 165, 294, 302, 312,
 334, 372
 Kissing, early significance of, 311
 Kissing, as a sexual act, 334
 Klein, D., 90
 Klein, M., 165, 340
 Koffka, K., 33, 56, 131, 182, 188
 Kohler, W., 173, 187, 221, 299
 Koller, L., 222
- Langer, S., 353
 Language, *see also* Speech
 advances from 1; 6 to 2; 0, 395,
 398

- Language, adverbs of time and place, 407
 difficulty of grammatical classification, 406
 early individual differences, 369
 early social influences on, 369
 early use of names, 379
 essential bases of, 367
 Gesture-, 375
 realization that things have names, 404
 stages of development, Appendix I
 understanding of, in first year, 377
- Lashley, K. S., 49
- Laughter, in apes, 234
 beginnings in infancy, 233
 at coincidence, 244
 at discomfiture of another, 242
 forms of in adult life, 244
 in idiots, 234
 at imitation, 240
 at incongruity in words and ideas, 243
 at the incongruous, 239
 in infancy, as expression of delight, 233
 in the midst of crying, 235
 at a new form of activity, 241
 in play, 239, 243
 at a pleasing object, 236
 at pretended crying, 295
 at recognition, 240
 at repetition, 237
 in response to laughter, 234
 responses, 176
 significance of order of development, 246
 suggested theory of, 247, 251
 at surprise, 237
 while teasing, 241
 various theories on, 231
- Lawson, H. B., 27, 450
- Learned, B. M., 234, 383
- Learning, voluntary, 363
- Levikova, H. M., 72
- Lewis, M. M., 371, 380, 386, 391, 466
- Line, W., 423
- Linguistic ability, early signs of, 11
- London Child Guidance Clinic, Report of, 17
- Loosli-Usteri, M., 24, 338
- Lorimer, F., 392, 393
- Love and affection, 301
- Lowenfeld, M., 160, 164, 166, 168 ff.
- McCarthy, D. A., 405
- MacCurdy, J. T., 127
- McDougall, W., 1, 33, 101, 120, 132, 161, 173, 177, 184, 187, 188, 206, 232, 243, 250, 253, 265, 283, 287, 293, 319, 334, 488, 508
- Mace, C. A., 104
- Major, D. R., *see* note at head of Index
- McGraw, M. B., 115, 133
- McGregor, D. H., 463
- McGinnis, J. M., 111
- Malinowski, B., 327, 351
- Malnutrition and intelligence, 53
- Marquis, D. K., 63, 72
- Masturbation, 347, 349, 350
 in infancy, 336
- Maturation, and exercise, 48
 experiment on, 45
 and higher functions, 49
 meaning of, 42
 and physiological conditions, 51
- Maudry, M., 78
- Meaning, 421
 the dawn of, 376
- Mental, deficiency, early diagnosis of, 3, 6
- Mental development, and physiological conditions, 52 ff.
- Memory, *see also* Remembering
 earliest of adults, 362
 early, revealed in dreams, 365
- Meumann, E. F., 380
- Millichamp, D. A., 86
- Mimesis, 181
- Mirror writing, 509
- Mongols, tendency for development quotient to decrease, 6
- Monologue of infants, 416
- Montessori, 48, 481
- Moodie, W., 15, 168
- Moore, K. C., *see* note at head of Index
- Morgan, J. J. B., 84
- Morgan, Lloyd, 186
- Moro's reflex, 113
- Mother, early preference for, 313
- Movement, conflict of volitional.
 with spontaneous, 81
 spontaneous, 74
 voluntary and reflexes, 109
 voluntary, signs of, 80

- Müller, Max, 388
 Murchison, C., 353
 Musical ability, 11
 Music, delight in, 156
 Myers, C. S., 34, 319, 357, 489, 508
- Naïveté of a child, 465
 Nelson, V. L., 7
 New-born, advances in second fortnight, 67
 diary of first fortnight, 64
 Nice, M. M., 401
 Nominal realism, 463
 Normal conduct in infancy, our ignorance as to, 17
 Numbers, first use of two, 470, 475
 of three, 473
 ideas of, 469
 summary of steps in learning, 479
 Nunn, Sir P., 163, 181
 Nursery School, 17, 35
 children, affection among, 307
 masturbation among, 338
 opportunity for early observation of maladjustment, 17
- Observation on children, method of, 26, 37
 Oedipus complex, 316 ff.
 Onomatopoeia, 14, 386
- Pain, fear of, 211
 in the new-born, 63
 sensitivity to, in first month, 68
 Parents, attitude to children of same and opposite sex, 320
 differences in attitude towards, 313
 first recognition of, 309
 as observers of own children, 32
 Parents, preferences for, Table I, 323; Table II, 324
 questionnaire on attitude towards, 320
 reasons for changes in preferences for, 325
 Pavlov, 120, 127, 137
 Perez, B., 92
 Persistence, 266, 279
 Pflüger, 114
 Physiological conditions and mental development, 48
 Piaget, J., 31, 396, 417, 444, 453, 460-1, 463, 464
 Pictures, realistic attitude to, 493
 understanding of, 491
- Play, among apes, 159, 165
 between 1;0 and 1;6, 146;
 1;6 and 3;0, 155
 definition of, 140
 at difficult tasks, 146
 dramatic, 154, 162
 fantasy, 163
 first forms of, 142
 five minutes' continuous, at 1;7, 150
 imitation in, 149
 interpretation of, 159
 make-believe, 151
 at new performances, 147
 with novel sensations, emotions or impulses, 157
 record of 10 minutes at 0;8, 145
 repetition in, 150
 social, 143, 147, 156
 summary of types, 171
 symbolic interpretation of, 164
 -therapy, 168
 with water, 164
 Pleasure, causes of early, 94
 Pratt, K. C., 69, 113
 Precocity, 57
 Preyer, *see* note at head of Index
 Pride and assertiveness, 279
 Problem children, and masturbation, 338
 need for early diagnosis of, 4
 and thumb sucking, 335
 Protective impulse, 297
 Psycho-analysis of children, 167, 340
 Psycho-analysts, interpretation of criticism of, 352
 interpretation of play, 163, 164
 Psycho-analysts and sex curiosity, 331
 views on determination of character in infancy, 4
 Pugnacity and anger, 265
 at 1;0, 2;0, and 3;0, 271 ff.
 sex differences in, 277
 play at, 273
- Questionnaire on sex, 344
 as to preference for father or mother, 322
 Questions, first, 399
- Rasmussen, V., 71, 153, 154, 158, 493
 Rau, E. F., 375

- Read, Carveth, 228, 428
Reasoning, early, 447
 at four years, 452
 generalizations used in, at 3
 years, 447
Reflex, arm raising, 112
 conflict with voluntary movement, 107
 defence, 75
 evanescence of, 112
 eye blink, 121
 as a test of development, 8
 in response to sounds, 125
 hand-grasp, co-operation with
 voluntary movement, 106
Moro's, 100
walking, 114
Reflexes, conditioned, 125, 137
 distinction from instincts, 132
 experiment on instability of, 128
 finger grasp, 102
 in infancy, summary of, 138
 inhibition of, 116
 sucking, 130
 transition from to purposive
 grasping, 104
 and voluntary movement, 109
Regression in mental development,
 55
Relation, of agency, 428
 of attribution, 431
 causal, 437
 and human motives, 437
 of difference, 432
 of evidence, 446
 of medium or instrument, 435
 part-whole, 446
Relation, of possession, 429
 Relations, apprehension of, 427
 expressed in language, 429
 of likeness and identity, 432
 reciprocal or symmetrical, 452
 spatial, 429
 of time, 466
Remembering, *see also* Memory
 direction and position, 363
 in the second year, 357
 summary of conclusions on, 365
 in the third year, 360
Retention of impressions not re-
 called, 359
Rhodes, E. M., 47
Richards, T. W., 7
Rickets, 52
Riddock, G., 116
Right- and left-handedness, 505 ff.
 in finger grasp, 103
Rivers, W. H. R., 34, 40, 133, 173,
 253
Rodger, A. G., 7
Rogers, C., 170
Romanes, G. J., 402
Rousseau, 43
Russell, Bertrand, 427, 428
Russell, L. J., 424
Sadism, 343
 apparent, 274
School, effect of early entry, 47
Self-assertion, 265
 deficiency of, in some children,
 285
 play at, 158, 282
Self-display distinguished from self-
 assertion, 283
 self-submission, 285
Semon, R., 249
Sex, curiosity about, 331, 344 ff.
 development, 57
 in infancy, supposed signs of,
 332
 in female infants, 340
 interest in, distinguished from
 sex impulses, 331
 play among savage children, 350
 summary of questionnaire on, 349
Shand, A., 301
Shape, apprehension of, 481
 geometrical, learning of, 481, 483
 test of perception of, by touch, 483
Shaw, Bernard, 249
Sherman, M., 88
Sherman, M. and I. C., 77
Sherrington, C. S., 65, 85, 101, 116,
 118, 121, 127
Shinn, M. W., 31, 62, 72, and *see*
 note at head of Index
Shirley, M. M., 27, 33, 50, 59, 63,
 74, 83, 90, 148, 302, 303, 311,
 369
Shyness, 287
 distinguished from fear, 289
 a separate innate tendency, 291
Sight, early activity of, 69
 and touch co-ordination, 107
Skills: stages of development,
 Appendix I
Sleep, finger grasp in, 103
 and suggestion, 255

- Smile responses, 176
 Smiles, the first, 92
 from 0 ; 2 to 0 ; 4, 235
 Smith, H. G., 375
 Smith, M. E., 367
 Social behaviour, stages of,
 Appendix I
 responses, early, 93
 first signs of, 309
 Solitude, 300
 Spearman, C., 58, 428 ff., 446
 Speech, *see also under* Language
 affective and conative aspect of,
 379
 after 3 ; 0, 415
 of children born deaf, 375
 communication of ideas, 398
 complex sentences, 415
 constructive work by the child,
 408
 development, graph showing
 relative progress of A, B, and
 Y, 13
 experiments on use of preposi-
 tions, 411
 first words, significance of, 384
 from 2 ; 0 to 2 ; 6, 405
 inflexions, use of, 413
 interchange of consonants, 390
 invention of words by children,
 385, 400
 invention of word-forms by
 analogy, 409
 learning new words, in specific
 contexts, 412
 negative, first use of, 399
 Speech, parts of speech used at
 1 ; 8, 403 ; at 3 : 0, 420
 playing with new words, 416
 practising new sounds, 391
 practising of, 371
 prepositions, first use of, 410
 sounds, earliest, 370
 imitation of, 372-3
 play with, 371
 three words used together, 397
 two words used together, 395
 words, generalization of, 392
 Spencer, H., 140, 232
 Spontaneous movements, co-opera-
 tion with reflexes, 76
 defence, 77
 Starling, 101, 135
 Stebbing, S., 427
 Stern, C., 35
 Stern, C. and W., 60, 381, and *see*
 note at head of Index
 Stoddard, G. D., 148
 Stone, C. P., 49, 51
 Stout, G. F., 34, 104, 135, 136, 186,
 206, 368, 421, 423, 428, 432, 466
 Strangers, attitude to, 288
 Stumpf, C., 384, 400
 Sucking, supposed sexual act,
 332-3
 Suggestibility, limits of, 260
 Suggestion, and aesthetic judg-
 ments, 260
 -auto, 225, 261
 contra, 262
 and cure of pain, 257
 of disgust or fear, 258
 experiment on, 260, 263
 and fear, 220
 and food, 259
 meaning of, 253
 and sleep, 255
 Sully, J., 39, 210, 242, and *see* note
 at head of Index
 Supposition of false hypotheses, 453
 Suttie, I. D., 352
 Sympathy, active, 297, 300
 primitive passive, 293, 295
 'Ta', history of use of, 381
 Taine, 400
 Tears, first appearance of, 87
 Temper tantrums, 18
 Temperament, and maturation, 48
 traits, report form on, 28
 Terman, L. M., 11
 Thinking, children's ideas about,
 461
 without words, 430
 Thompson, J., 77
 Thomson, Helen, 14
 Thorburn, M., 36, 146, 152, 158
 Thorndike, E. L., 2, 40, 172, 185,
 188, 196-7, 265, 292, 300
 Thought, child's interest in its own,
 463
 Thumb-sucking, 78
 and kissing, 334
 in problem children, 335
 Thyroid, effect of, 51
 treatment, effect of on defective
 infant, 3
 Tickling, laughter at, 237
 Tiedemann, 353
 Titchener, E. B., 132

- Time, first ideas of future, 467
 of past, 467
 ideas of relations of, 466
- Touch, experiments on learning
 shapes through, 484
 and sight co-ordination, 107
- Twins, experiment on, 45, 46
 retardation of speech, 388
- Tylor, 402
- Van Alstyne, 148
- Verbalism, 415
- Vocabulary, extension of passive in
 second year, 392
 of infants, 367
 of precocious boy, 419
- Wall, W. D., 113, 118, 131, 234, 329,
 369
- Ward, J., 34, 428, 433, 441
- Washburn, M. F., 186
- Washburn, R. W., 21, 200, 231, 233,
 238, 240
- Waterhouse, J. F., 409, 416, 491
- Watson, J. B., 2, 30, 40, 122, 172,
 203 ff., 213, 219, 223
- Weill, B., 306
- Wellman, B. I., 148
- Whitehead, A. N., 367
 'Why'?, understanding and use of,
 437
- Williamson, H. P., 27, 106, 123, 209,
 215, 369, 372-3, 391
- Wolters, A. W., 457
- Words, significance of combining
 two, 425
 thinking without, 430
- Wordsworth, 460
- Yerkes, R. M., 159, 234, 270, 383,
 391